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ANOCI-ASSOCIATION IN RELATION TO OPERATIONS ON THE GALL BLADDER AND STOMACH*

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In reviewing the records of 893 operations on the biliary tract and 331 operations on the stomach performed by my associates, Dr. Bunts and Dr. Lower, and myself, together with those performed by other surgeons at the Lakeside Hospital, we find that the clinical course of certain patients after gastric resections and after common-duct operations is similar in many respects. At the time of operation pulse and temperature are normal, but the patient is emaciated and sallow in appearance vitality is much reduced; his demeanor is melancholic and he is alternately possessed by hope and despair. After the operation his downward course and exit strikingly resemble the sinking and disappearance of the unwary traveler who has been trapped by quicksand.

Statistics show that no clinic has ever reduced the mortality rate of any considerable series of resections of the stomach below 10 per cent., and the mortality rate of infected, obstructed common-duct operations is scarcely less. When the surgeon is obliged to tell the prospective patient, whose courage has already been lowered by the disease itself, that his chances for recovery from the operation are but one in ten, the patient is naturally reluctant to accept the risk, or else he undergoes the operation in a hopeless spirit which augments the peril.

The purpose of this paper is to offer a probable explanation of this postoperative morbidity and mortality and to discuss a method by which the patient may be steered clear of the metabolic quicksand. The cause of the high mortality of gastric and gall-bladder operations is exhaustion—not the exhaustion induced by trauma and infection, though this may indeed be a contributory cause, but exhaustion which is the result of the lack of function of a fundamental organ.

This postulate is based on experimental as well as clinical evidence. In my laboratory, my associates Dr. J. B. Austin, Dr. F. W. Hitchings and Dr. M. L. Menten have made histologic studies and H-ion concentration tests after the excision of each of the following organs—the liver, the adrenals, the thyroid, the pancreas, and the spleen. Only double adrenalectomy and hepatectomy caused a steadily increasing exhaustion and death in less than twenty-four hours. These operations were the only ones followed by a marked increase in the hydrogen-ion concentration of the blood, this increase appearing in from a few to twelve hours or more and being the immediate precursor of death. Excision of the liver or of the adrenals also caused marked changes in the brain cells.

We then made histologic studies of every tissue and organ in the bodies of animals exhausted by prolonged insomnia; by infections; by fighting; by physical injury; by fear; by slow etherization and by the injection of toxins, of alcohol, of skatol, etc. In every case, identical changes were found in the brain, the adrenals and the liver, and in these organs only. In brief, exhaustion from any cause is manifested by identical clinical symptoms and by identical histologic changes in the brain, the adrenals and the liver. A given case of exhaustion may have been initiated by the inanition of vomiting; increased by pain; carried further by infection; still further by the strain of etherization; another step by the unblocked traumatism of the operation; until postoperative pain, even if not severe, finally overcame the already lowered powers of endurance and the patient died. According to the margin of safety in the individual patient the fatal sequence may be terminated at any point.

I have stated that three organs are especially concerned in this progressive exhaustion, but the primary significance of one of the three—the liver—in the cases we are considering, may not at first be manifest. One of the most important functions of the liver is the neutralization of the acids which, as our hydrogen-ion concentration tests have shown, are a by-product of energy transformation. Disease processes, emotion, physical injury—every kind of response to stimuli produces acidity. Under normal conditions the liver and the adrenals—which share in the neutralization process—can quickly restore the body fluids to their normal, slightly alkaline condition.

If a starved and worried patient be traumatized, the margin of safety must necessarily be reduced; acidosis will be present or threatened and but a slight additional stimulus will suffice to produce the fatal result. But ether and nitrous oxid anesthesia cause marked acidity in the blood, which normally is neutralized in about thirty minutes; ether, however, adds an adverse chemical effect and a psychic strain. Every contact between instruments and tissue under naked-nerve ether anesthesia causes a discharge of energy and increases the acidity; the postoperative pain stimuli do likewise until at some point the body's stores of energy are exhausted and the liver is no longer able to meet the demand for acid neutralization. Long before the operation is completed, the patient's doom is sealed.

Treatment is of little avail. The administration of sodium bicarbonate and glucose by mouth, of bile by

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rectum, and excellent nursing may aid, but in most instances they accomplish little. The only cure is prevention (*a*) by increasing the store of energy and (*b*) by stopping the expenditure of energy and the consequent fabrication of acid. The first end may be accomplished by increasing the intake of food and water; by the administration of sodium bicarbonate and glucose, and by having the patient sleep in the open air. Energy may be conserved by limiting physical activity and so far as possible eliminating worry and anxiety before the operation; and by diminishing acid production during and after the operation by complete anoci-association.

With the starved patient no anesthetic and no narcotic is safe. Anesthetics increase acidity in a direct ratio to the amount given; morphin does not increase acidity but does interfere with neutralization. Psychic quiet for these patients may be safely secured by bromids administered per rectum. Just enough nitrous oxid should be administered to give a twilight anesthesia so that the patient may be protected against the destructive action of fear. The infiltration of novocain in 1:400 solution precedes each division of nerve-bearing tissue. An ample incision is made and a feather-edge technic is employed throughout the operation. To insure complete relaxation during the operation and to promote postoperative comfort the abdominal wall at a distance from the incision is thoroughly infiltrated with quinin and urea hydrochlorid in 1:600 solution.

If the margin of safety is very narrow the operation is performed in two stages. For example, a gastro-enterostomy is followed by gastrectomy after the nutritional balance has been restored; or in a case of common-duct obstruction with infection, the gall-bladder is first drained until the jaundice disappears and the margin of safety is enlarged, when the stones may be removed safely.

Another great danger in gall-bladder operations is interference with the function of the liver by injuring its nerve supply. In our experiments we found that blocking the nerve-supply to the liver caused histologic changes. We found also that when the splanchnic nerves are roughly handled the brain cannot control the epinephrin output.

A sharp knife, bloodless dissection, the elimination of pulling and tearing manipulations and a minimum amount of sponging are required. Because of the very slight insulation of the splanchnic nerves, their injury is surprisingly easy; for this reason also, therefore, the two-stage operation is advisable in critical cases, as thus a smaller number of splanchnic nerves will be injured at one time and the interference with the functions of the already almost overwhelmed liver and adrenals will be diminished.

These deductions are based not only on laboratory experiments but on clinical observations as well. Since I have begun to apply these principles in gall-bladder and stomach operations I have seen a remarkable improvement in the results.

The postoperative care of these patients is of vital importance. Skilful, tactful nurses by creating an innocuous environment can most valuably second the efforts of the surgeon who, in the patient's room as clearly as in the amphitheater, visualizes the clinical problems which his special case presents.

A brief word may well be added concerning the danger of postoperative pneumonia. This danger may be almost eliminated by discarding ether and by the infiltration of quinin and urea hydrochlorid at a distance from the wound. The tendency of ether to cause bronchitis and pneumonia is generally recognized. Pneumonia does not result from the use of nitrous oxid oxygen. Even without ether, however, a painful wound may in itself cause pneumonia. When a wound in the upper abdomen is painful, the respiratory excursions are inhibited; the lung is not expanded, and pleurisy and pneumonia are the natural result. The painless wound which is assured by the use of quinin and urea hydrochlorid will, therefore, prevent postoperative pneumonia.

The complete application of the principle of anoci-association, not only during the operation but also in the preoperative and postoperative care of the patient, will minimize the two greatest dangers attending gall-bladder and stomach operations—exhaustion with its fatal sequel, acidosis, and postoperative pneumonia.

Osborn Building.

ABSTRACT OF DISCUSSION

DR. W. D. HAGGARD, Nashville, Tenn.: We are greatly indebted to Dr. Crile for the elucidation of factors of which we have evidently been hitherto unaware. We have been so engrossed with the pathology that it may be said we have been pathologically wise, but physically foolish; but Dr. Crile has joined the experimental with the practical. Gentle manipulations and extreme care should be used particularly in those cases in which the great primitive organs of the body are concerned. We learn from surgical associates, of patients with chloroform poisoning who die on the fourth and fifth day without apparent cause. The blood-count is just like that in phosphorus poisoning. So we find that in surgical deaths when this drug is not used the important function of the liver has been interfered with. We seem to forget that the sympathetic nerve controls the liver and in our operations on this organ and the common duct, a perfectly mechanical thing, our mortality has been frightful because we have ignored the fact that, if we destroy the innervation of this big center of the body, we not so much destroy the patient's resistance as inhibit his opportunity for recovery. I was glad Dr. Crile referred to the gall-bladder as he did, because we have had the pendulum of opinion going to and fro, some thinking that if the gall-bladder is lost our landmarks are gone. I had this experience in an ordinary inflamed gall-bladder which I left in. I had the intense chagrin of seeing that patient develop malignant neoplasm of this retained gall-bladder. An experience of that kind does much more to shape our course than any theorizing. When put to the test of analysis, how unwise it seems to leave the thickened, inflamed gall-bladder which is already functionless and out of commission. Why not remove it so that the patient can have the benefit of immediate and permanent recovery? Our generation will scarcely appreciate keenly enough the remarkable addition to our therapeutic resources that have come from the elaborate and convincing studies presented by Dr. Crile and his associates.

DR. ERNEST LAPLACE, Philadelphia: So eminent a man as Sir Berkeley Moynihan said in my presence that Dr. Crile's work was the greatest thing in surgery since the work of Lister, and I believe it. For years I have taught that there was but one kind of shock, and that traumatic, emotional, chemical or physical shock must produce the same material results. It remained for Dr. Crile to prove that assertion. The logical sequence to this has been the birth of anoci-association with the wonderful improvement in the operative recovery of patients. Hence, we must diminish the causes of shock. Mechanical interference and tampering with the peritoneum, especially in the region of the gall-bladder and liver, is probably one of the greatest additional causes of shock. Gall-bladder surgery just now is undergoing the same course that appendiceal surgery went through some

years ago. The gall-bladder is a diverticulum like the appendix which should be removed if it has ceased to serve its purpose. Gall-stones likewise should be removed with the least shock-producing procedures, quickly, and with the least interference with the peritoneal cavity leading to anoci-association. With that object in view I have devised a simple liver retractor. In removing the gall-bladder the liver was formerly lifted by the hand of an assistant. Instead, I now lift the liver with a long smooth wire retractor while the gall-bladder drops into a forked space in the center of the retractor. This facilitates the dissection of the gall-bladder and affords a better view of the gall-ducts and neighboring structures. This is a step in carrying out the shockless operation, as it facilitates and expedites the work.

DR. ROBERT T. MORRIS, New York: Dr. Crile has reduced to analysis principles I have held for many years. The principles of the fourth era of surgery I stated very crudely, but at least felt clinically the experience that was giving this trend, and expressed it in various ways. I taught for many years the crude outline form of anoci-association. Many of us have been doing the same thing. Dr. Crile has simply given us a refined product because of his philosophic method of work; synthesis in association with his scientific analysis.

DR. ALBERT J. OCHSNER, Chicago: If we go home with the valuable principles which are at the bottom of the remarkable clinical success of Dr. Crile's work, and with a thorough appreciation of the fundamental principles, we will be the gainers. The fundamental principle is, in the first place, to widen as much as possible the margin of safety. The various things that Dr. Crile does in his practice inspire the patient with confidence, making him feel that he is in the best hands under the conditions in which he exists. Everything is favorable, the patient is in the hands of nurses who know that things must go well after Crile has finished the operation. Every surgeon should introduce this element and carry it out in his work. He should not do his work where forty other surgeons are doing bad surgery. The second principle is that none of this margin of safety should be wasted. There is neither insane haste nor imbecile deliberation in Dr. Crile's work. His surgical judgment indicates what should be done and after he is through with the operation the best possible and nothing harmful has been done. Another fundamental principle is that all the useless things done must be harmless; for instance, introducing quinin and urea hydrochlorid. This is one of the useless things, a little of which will do the patient no more harm than any one of many other useless things. Many Christian Scientists have come to me for operation. I have found that one of these patients will do better after an operation than another patient after the same operation, simply because that element of waste is eliminated. The value of faith in the remedial element I saw illustrated some twenty-five years ago when I was chief assistant to Charles T. Parkes. A visitor after a week with us said it was wonderful that our anesthesias went so quietly, that we had no vomiting, that the patient's condition was perfect throughout the anesthesia. "How do you do it?" Dr. Parkes replied, "We give morphin ¼ grain and atropin 1/100 grain half an hour before the anesthesia is begun." A nurse who heard this came to me and said, "I have been on duty for a year and a half and I have never given this. Is it possible that I should have known this and that I was not informed when I undertook this work?" We had no cyanosis during the anesthesia; we had almost no postoperative pneumonias. A man from the East came to my hospital with a remedy which was intended to stop postoperative vomiting. He told a very plausible story. I instructed the superintendent of nurses to use this in every case of postoperative vomiting. Some time later I asked her whether the remedy was doing what was claimed for it. She replied, "We have had no postoperative vomiting." Now if I had done some useless thing, so long as it was harmless, it would have seemed good practice, and it would have been most natural to attribute the good results to this factor.

DR. CONRAD A. HOWELL, Columbus, O.: No one follows out the principles which Dr. Crile has endorsed more than I. It was from Dr. Crile that I first got the impelling motive to use his technic and the principles involved in anoci-association. So much have I been impressed with the necessity of rest, both mental and physical, that a patient who goes into a hospital the night before the operation is made to sleep under the influence of veronal. I consider ten or twelve hours sleep the *sine qua non* for the operation which is to take place next morning. I can readily imagine what the thought would be that every tick of the clock means a second nearer the time set for the operation. As to the use of narcotics, morphin, hyoscin, I do not use them as was suggested by Dr. Ochsner. My operating hour is 9 a. m. The veronal which was administered the night before keeps my patient asleep until 7 a. m. At 7, dependent on the physical characteristics of the patient, I order morphin ⅓ grain, hyoscin, 1/200 grain, and at 8 I repeat a similar dose, with the object of keeping the patient's mentality, his cerebral centers, in a completely sedative state until 9, the time set for the operation, and not in that raspy, keen pitch, which would be the case if these narcotics were administered only one-half hour before he is to be operated on. Veronal the night preceding the operation, morphin and hyoscin at 7 and 8 keeps the patient in a tranquil condition from the time he wakes until the time of operation. The morning hour is the time for operating, not the afternoon—the morning hour when the patient has been refreshed by sleep, when there has not been a long interval between the time of waking and the time set for operation. With regard to quinin urea hydrochlorid, do not use it strong (1 per cent.). Do not use it near the skin. It produces a fibrinous exudate which strangulates the blood-vessels supplying the skin and will cause a slough. Use it deep in the muscular structure; use it in the parietal peritoneum. I cannot agree with Dr. Crile when he says that he puts patients to bed and gives them bromids because, using quinin and urea hydrochlorid in the strength which I do (1:400), I must confess that the patient still suffers pain, though not the amount that would be present without the use of that drug. I believe that pain breaks down cerebral cells if kept up for hours after an operation, and tends to produce shock; therefore I use morphin in small doses as a postoperative adjunct.

DR. GEORGE W. CRILE, Cleveland: We never give morphin to a very old or very young patient, or to one who is very sick. We do give morphin grain ⅙ and scopolamin grain $\frac{1}{150}$ to patients who are not debilitated. After the operation we do not hesitate to give morphin again, in small doses. We also use novocain. It does not interfere with the healing of wounds. Quinin and urea hydrochlorid injected into the skin does produce a marked reaction in the tissues, but, as Sir Berkeley Moynihan states, if quinin and urea hydrochlorid is injected at a distance from the wound itself it will interfere with healing no more than any other manipulation does. When quinin and urea hydrochlorid in 1:600 solution is injected at a distance from the wound it does not come in contact with the wound itself. Of course whether quinin and urea hydrochlorid will ultimately prove to be as valuable as we now think it is, will be determined by the testimony of the patients.

Challenge to Christian Science.—The following proposition was made at a lecture on Christian Science by J. W. Springthorpe, Melbourne, Australia (Therapeutics, Dietetics and Hygiene, ii, 651): "Leaving the abstract for the concrete, I will now undertake to demonstrate to the local coterie of Christian Scientists that their minds do not dominate their own bodies, much less the bodies of others, and I will do so with drugs, which they say are powerless. Thus with one drug I will make their president speechless and motionless; with another I will make their vice-president red all over or perspire horribly, whichever she dislikes most; with a third their treasurer the sickest possible in the time; and with a fourth their secretary unable to read her 'Bible', though she shall still see the book. Surely here is real 'fruitage'—or failure." Needless to say, the challenge, though reported to headquarters, was not taken up. It is hardly necessary to add that chloroform, amyl nitrite, pilocarpin, apomorphin and atropin would have produced the effects mentioned.

EXPERIMENTAL SURGERY OF THE HEART, LUNG AND TRACHEA*

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HISTORICAL

In a not very distant past surgical interference of the heart itself was considered quite out of the question, and even its suggestion seemed highly ridiculous.

As late as 1888 Rydinger said that "the proposal of suturing of heart wounds hardly needs any serious consideration." Even Billroth told his friends that any one who tried to suture a heart wound would surely lose the respect of all his confrères. No doubt unknown to these authorities, however, about this time experimental work was being done along these lines. As early as 1812 Block[1] demonstrated a dog in which he had successfully stured the heart. He was followed by Howell and Donaldson,[2] in 1884, Phillipson[3] (1886) and Del Vecchio[4] (1894). Then came Cappelen and Farina,[5] each with an attempt at heart suture in man with disastrous results, followed by Rehn[6] in the same year with the first successful suture of the human heart. Thus the path was broken and in 1913 Wagner[7] was able to collect 260 cases with the truly marvelous result of almost 50 per cent. recoveries, and now the researcher is patiently paving the way for a surgical invasion of that sacred Lhassa of the human, the interior of the heart.

Surgical attack of the pericardium has a great deal longer history, and there is reason to believe that tapping of the heart-sac was practiced by the ancients and surely by the medieval surgeons.

Riolan[8] talks of the permissibility of opening the chest wall for pericardial effusions. He, however, cites no cases. One of the first, if not the first, to incise the thoracic wall for the purpose of reaching the pericardium was the famous Larrey,[9] the surgeon-general in Napoleon's army, who in his interesting memoirs describes a case of self-inflicted heart-wound followed by empyema of the heart-sac in which he bravely incised the chest wall between the fifth and sixth ribs and evacuated a great amount of fluid, followed by temporary improvement of the patient. He also palpated the apex of the heart with his fingers.

Romero[10] a little later also incised the pericardium and further on reported some cases to the Faculty of Medicine in Paris. This society, however, disapproving of the operation and lest others might imitate, refused to publish the paper in its *Proceedings*. The operation is also reported by Fowett,[11] Karawagon and others. Early experimental work was done by Amerito,[12] who concluded that animals thrived fairly well without the heart-sac.

The history of lung surgery extends back to Hippocrates, who was probably the first to describe pneumonotomy (Ricketts[13]).

Bolgius (1710) was one of the first to incise the pleura for lung wounds. Rolandus of Parma published the first account of successful operation for hernia of the lung. Fabricius Hildanus (1646) and Ruysh (1777) recorded cases in which portions of the lung had been excised.

Camparadon treated abscesses of the lung with surgical intervention, and Baglion in 1714 advocated operative measures in pulmonary tuberculosis.

The modern history includes a number of brilliant clinicians and researchers, and rapid advances are recorded due to the perfected operative technic and all important aid of artificial respiratory apparatus introduced by Sauerbach.

Estlander[14] was the first to treat empyema with thoracoplasty.

Tuffier had done a great deal of well recognized work along the lines of lung surgery. De Lormo, Ombonin and Michaux (Ricketts) performed pneumonectomies for grave injuries to the lung.

Willard reported bronchiotomy from behind for foreign bodies in the bronchus.

Murphy[15] conceived the brilliant idea of adapting the accepted method of rest for tuberculous lesions to that of the lung by introduction of nitrogen gas in sufficient quantities to completely collapse the lung and thus immobilize it. Other pioneers are Mosler, Kolle, Bull, Roswell Park, Lemcke, Fenger, Reclus and many others.

According to Newberger and Pagels[16] tracheal surgery in the form of tracheotomy was known to the Jews before the Christian era and probably also to the Greeks and Romans. In the sixteenth century Vidus Vidius (Pagels) is said to have opened the trachea and inserted gold and silver tubes.

The modern work of the lung-tube concerns the repair of the tracheal defects and resections of which the first attempt was made by Gluck and Zeller[17] (1891), who in working on the esophagus of a dog accidently tore the trachea and repaired it. The first premeditated attempt was made by Colley[18] in 1895.

Kuster[19] was the first to report resection of several rings of the windpipe, followed later by Foederl, von Haecker Konig.

The first intrathoracic suture seems to be the one reported in this paper (by me).

The status of the present thoracic surgery in all its branches is due in a great measure to the brilliant clinicians and researchers of this country, namely, Carrel, Bernheim, Cushing, Willy Meyer, Robinson, Murphy, Halstead, Elsberg, Crile and others.

GENERAL TECHNIC

Owing to the extreme susceptibility of the pleura and the pericardium to infection, the most painstaking and scrupulous asepsis must be maintained. The defensive power of these serous sacs is greatly less than that of the peritoneum, so that procedures that would prove fairly satisfactory in intra-abdominal work would be absolutely fatal in an intrathoracic invasion. The resistance of the pleura as to that of the chest wall is almost incomparable, as behind a per-

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Block: Gaz. med. de Strassbourg, October, 1882.
2. Howell and Donaldson: Phil. Tr. Roy. Soc. London, 1884, Part 1, p. 139.
3. Phillipson: Russian Med., 1886, iv, 187.
4. Del Vecchio: Internat. Cong. Med., Rome, 1894, iv, 297.
5. Farina: Ztschr. f. Chir., 1896, p. 1224.
6. Rehn: Jour. Exper. Med., v, vi, 488.
7. Wagner: Deutsch. Ztschr. f. Chir., cxix, 222.
8. Riolan: Encheiridium Anatomicum, Paris, Ed. 4, 1658, p. 213.
9. Larrey: Mémoires de chirurgie militaire, Paris, 1812, iii.
10. Romero: Dictionnaire des sciences médicinales, 1819, 370.
11. Fowett: Gunther's Blutigen Operationer, iv, Part 3, p. 102.
12. Amerito: Internat. Cong. Med., Rome, 1894, iv, 301.
13. Ricketts: Surgery of Head and Lungs.
14. Estlander: Nord. Med. Arch., 1879, v, 11.
15. Murphy, J. B.: Surgery of the Lung, The Journal A. M. A., 1898, xxxi, 151, 208, 281, 261; Internat. Cong. Med., Paris, Section of Surgery.
16. Newberger and Pagels: Handb. d. Gesch. d. Med., i, 117.
17. Gluck and Zeller: Arch. f. klin. Chir., 1891, xxvi.
18. Colley: Deutsch. Ztschr. f. Chir., xl, 150.
19. Kuster: Wien. Klin., 1890, Nos. 3, 4.

fectly healed chest wall without at least any macroscopic sign of infection you may have a pleural cavity filled with pus and this without any bronchial leakage. Thus it is of the greatest importance to use every possible precaution in thoracic work. The animal should receive the antiseptic bath a day or two before the operation. At the time of operation it is well to give an antiseptic mouth wash. The tracheal tube should be boiled for each animal. The coil of the tracheal tube we often pass through hot water. The operative field should receive the most pedantic toilet.

In all our work we have used the intercostal incision and sometimes after entering the thorax the opening has been forcibly stretched. This has given splendid exposure and to me it has seemed better than the flap opening in that it creates less abnormal conditions, namely, fractured ribs, cut muscles, divided nerves, etc. It surely causes less postoperative disturbances, healing sooner, and with less chance of infection.

The wound edges should be covered with sterile gauze. All tissues should be gently handled with instruments. It is preferable not to touch the interior of the chest with fingers. As suggested and practiced by Carrel, packing should consist of oiled Japanese silk and then be covered with moist hot sponges. The local atelectasis produced by pressure from sponges should be remedied by forcible expansion of collapsed area before the chest is closed.

Great stress has been laid on forcible inflation of lung before suture of the chest cavity. This is probably desirable but not at all important, as the animals in which we neglected this maneuver fared just as well as the others. However, it may be good practice. The wound suture must be done carefully in layers. We used catgut and the deeper stitches we placed around the two adjacent ribs thus making a perfect splint. This undoubtedly enhances the healing and surely lessened the postoperative discomfort.

This wound was dressed in plain gauze, pneumonia jacket applied, and animal surrounded with hot-water bags in its cage. Morphin was given before and after the operation.

For artificial respiration we used a simple home-made affair consisting of two automobile pumps made by Dr. Simon and later perfected by my assistant, Dr. Rahe.

EXPERIMENTAL WORK

For the following experiments 120 cats have been used, including those used for development of technic. Complete clinical records have been kept of each one by Dr. Rahe. Space does not permit of all the observations being printed. I have given only the main data. Some of the animals have been kept over half a year. We should have liked to have saved a great number for long periods, but this was impossible on account of inadequate quarters.

I. PERICARDIUM

Complete excision was done in order to study the clinical findings and the extent of adhesions following. Practically no disturbance follows the procedure. The animals acted as before operation and nothing could be heard on auscultation. One was kept for over six months and was in splendid condition when killed. Adhesions were found mainly to the mobile lung, which explains the lack of symptoms.

Repair of pericardial defects might become necessary following mediastinal operations. Great loss of pericardial tissue cannot be remedied by drawing the sac together with sutures, as the heart will not endure the pressure caused by a tightened pericardium. This we have often noticed.

In two cats we closed the pericardial openings with a lipofascial flap from the chest wall. This flap should be made quite long, as it later contracts and then may cause serious trouble, as happened in one cat probably by causing too much traction on vessels at the base of the heart. In a few cats we replaced the excised heart-sacs by a piece of omentum. This, however, is of very doubtful value as there is great danger of the transplant not thriving and, if successful, it forms close adhesions all around the heart and to the surrounding lung. For some reason that I cannot explain, these animals suffered more than any of the others we used in this research.

Strips of pericardium might be used as artificial ligaments if ever cardiopexy should be practiced.

CAT 1.—April 15, 1913. Excision of pericardium. Killed July 20, 1913. Heart glistening, few adhesions to lungs, and mediastinum otherwise normal.

CAT 2.—Jan. 16, 1914. Killed May 21, 1914. Slight adhesions to lung, some to mediastinum. Heart smooth, of normal size, interior normal.

CAT 3. —July 18, 1913. Repaired pericardial defect with lipofascial flap. Died July 24. Contraction of flap seemingly interfered with heart action.

CAT 4.—July 18. Operation as before. Killed Aug. 20, 1913. Flap took well; adhesion of lung to suture-line.

CAT 5.—Oct. 14, 1913. Excision of pericardium, and replaced by transplanted omentum. Killed Nov. 9. Omental transplant adherent to heart and lung. Heart normal.

CAT 6.—Nov. 10, 1913. Operation as above. Died November 13 from infection.

CAT 7.—November 12. Operation as above. Died November 19 from sloughing of transplant.

II. HEART

Before going into details of our work it would probably be of some interest to consider the special technic of heart surgery.

After the chest cavity is opened, the pericardium is picked up in much the same manner as the peritoneum. A small amount of clear watery fluid escapes on incising the sac. The incision may be made in various ways. We made a longitudinal straight cut. By experience we found it best not to make this opening too near the base of the heart, as in sewing up you may cause too much tension in this region, resulting in acute cardiac dilatation. By making slight traction on the edges of the pericardium the heart is drawn slightly forward and partly or entirely delivered from it. The heart must be drawn forward carefully as too much traction is one of the great dangers in heart surgery. Many a cat did we lose in the preliminary experiments before we recognized this very important fact.

In doing intracardiac work, hemostasis becomes at once the foremost problem. This has been solved in different ways. Rehn,[20] Magnus and Noetzels used digital compression of the right auricle or temporary ligation of the vena cava, but this could be maintained for only one and one-half minutes. Schepelman[21]

20. Rehn, L.: Verhandl. d. Deutsch. Gesellsch. f. Chir., 1907.
21. Schepelman: Deutsch. Ztschr. f. Chir., 1913, cxx, parts 5 and 6, p. 573.

applied ligature on vessels at some distance from the heart. He also clamped the heart with rubber-covered clamps. Haeckers asserts that the heart could endure clamping of the vena cava from nine to ten minutes. Carrel occludes the aorta for two to six minutes. Lange puts a ligature around both auricles. We have used an ordinary bowel clamp without clasp suggested by Dr. Rahe. With this instrument we applied just enough pressure to produce hemostasis, doing absolutely no damage to the heart-muscles.

In applying clamps one should avoid the area about the junction of the upper with the middle third of the anterior longitudinal sinus, the mechanical irritation of which may cause acute dilatation of the heart (Spongaro[22]).

Another dangerous region is at the junction of the right auricle and the vena cava. In incising the ventricles it is advisable to avoid the coronary vessels and to make a straight clean cut. Almost the entire ventricle may be laid open. A small wound bleeds only during systole, a larger one both during systole and diastole.

The opening is best sutured with fine silk. We used continuous suture.

If at the close of an operation the heart acts badly we have found it fatal to suture the pericardium completely. To a poorly acting, partly dilated heart, pressure is just as harmful as excessive traction on the organ. Under such conditions the heart absolutely needs sufficient room for action; otherwise it soon begins to fibrillate.

In two cats after having finished the operation we saw the animals going through all the ordinary antemortem symptoms, using all the accessory muscles of respiration, exhibiting facial spasm and the final gasps. On rapid opening of the wound and the pericardium, the heart was soon acting normally. The pericardium was left open. Both animals survived.

There is no doubt that some of the human heart-wound patients on whom operation is performed and which terminated fatally might have been saved had the pericardium been left open.

To me, as well as to other observers, it has been astonishing how little immediate reaction the animals have shown from this work. Cats which have had their ventricles opened and digitally explored, instruments passed from ventricles into auricles and even up into the veins, auricular appendixes removed, stab-wounds through and through the heart have been jumping off and on tables in less than an hour after the operation. In few of our animals did we hear anything abnormal on auscultation. In some there was irregular heart action and only occasionally did we hear murmurs. Postoperative findings have been very few.

III. CARDIOTOMY WITH INSTRUMENTAL DILATATION OF AURICULOVENTRICULAR VALVE

Surgery of the valves was first suggested by Brunton,[23] who asserted that a mitral or tricuspid stenosis could undoubtedly be remedied by operative measures, transforming the condition into a mild insufficiency. As this lesion in animals is a great rarity, it had to be produced experimentally in order to test out the value of such operative therapeutics. Thus Bernheim[24] and others produced the lesion by passing a silk ligature around the valve. Bernheim used twenty animals, of which ten survived from a week to ten months.

The valves may be reached operatively either through the vessels, or as seems far preferable, through the ventricles. Rosenstein was the first to attack the valves directly in an attempt to produce tricuspid insufficiency, passing instruments through a great neck vessel. By far most of the animals died.

Cushing and Brandt[25] worked through the so-called laparothoracoscope, cutting the stenosis. They succeeded in six out of twelve animals. Haecker[26] opened the ventricles and cut the valve with the aid of the eye. All the animals died. Jacobaeus and Lilgestrand used puncture instruments and performed the operation by the sense of touch.

Schepelman[27] aims by ventricular and auricular anastomosis to equalize circulation in tricuspid stenosis. Rather formidable an intervention, I think.

We aimed to remedy the lesion by stretching the contracted opening with ordinary artery forceps. The ventricle was opened more or less forcibly. The value of this experiment is, of course, greatly minimized as we had not previously produced an artificial stenosis; still we wanted to ascertain how the animals would endure this manipulation. Our animals stood this about the same as an ordinary cardiotomy.

Cat 8.—Operated on, April 17, 1913. Died Dec. 12, 1913. Heart dilated; fluid in abdomen.

Cat 9.—Operated on, April 23. Same operation. Died on table.

Cat 10.—Operated on, April 24.—Died on table.

Cat 11.—Operated on, April 25, 1913. Posted July 1. Adhesions between lungs and chest. Heart incision healed perfectly. No enlargement; internal surface smooth.

Cat 12.—Operated on, May 5, 1913. Killed July 10, 1913. Heart normal in size; small line where opened; no adhesion between lungs and chest.

Cat 13.—Operated on, Oct. 15, 1913. Heart also punctured with hat-pin. Killed Oct. 28, 1913. Findings similar to above.

Cat 14.—Operated on, Oct. 17, 1913. Died October 28. Purulent infection in chest cavity.

Cat 15.—Operated on, Oct. 17, 1913. Died Oct. 19, 1913. Lungs congested; sink in water.

Cat 16.—Operated on, Oct. 21, 1913. Died three hours after operation; acute dilatation of heart.

Cat 17.—Operated on, Oct. 22, 1913. Killed December 4. Few adhesions, otherwise negative.

Cat 18.—Operated on, Oct. 29, 1913. Left auricle removed; hat-pin thrust through heart. Died December 28 from intercurrent disease; few adhesions along cut; interior of heart normal.

Cat 19.—Operated on, Feb. 24, 1914. Transverse incision in heart. Killed, March 20. Scar very distinct; lung adherent to it; heart somewhat enlarged.

Cat 20.—Operated on, Feb. 25, 1913. Killed June 2. Slightest adhesion to cardiac wound, otherwise negative.

IV. PUNCTURE-WOUNDS OF THE HEART

Excepting those of a certain area in the anterior interventricular groove, puncture-wounds of the heart, unless very extensive, cause only temporary disturbances, the degree of which varies with the type of the insulting agent. Needle punctures, even those going through and through the organ, cause only, as a rule, a momentary increase in the heart action, which

22. Spongaro: Arch. Internat. de Chir., 1907, iii.
23. Brunton: Lancet, London, 1902, i, 362.
24. Bernheim: Bull. Johns Hopkins Hosp., April, 1904, p. 107.
25. Cushing and Brandt: Jour. Med. Research, 1908.
26. Haecker: Arch. f. klin. Chir., 1908, lxxxiv, 1035.
27. Schepelman: Deutsch. Ztschr. f. Chir., cxx, 370.

may at times become tumultuous, especially at the time of introduction of the needle, but in a short time the action is perfectly normal. In one cat we made four such punctures. It made an uneventful recovery. In another we punctured the heart with a mosquito forceps with similar results. In the course of other operations we often punctured the heart here and there, without seemingly greatly adding to the danger of the operation. The hemorrhage following is very slight, and unless the coronary vessel is injured no ligature is needed.

In knife stab-wounds the disturbance is somewhat more prolonged, and a suture is needed at entrance and exit of the wound tract.

Multiple stab-wounds are of course serious, but it is remarkable to what extent the heart may be damaged and still recover. This, of course, refers to injuries received under aseptic conditions.

CAT 21.—Operated on, Feb. 4, 1913. Four through-and-through needle punctures. Killed March 14. Heart negative.

CAT 22.—Operated on, June 4, 1913. Mosquito forceps passed through the entire heart. Killed July 3, 1913. Heart showed no signs excepting small white spots where puncture was made.

CAT 23.—Operated on, March 14, 1914. Knife stab-wound through and through left ventricle. Died March 16. Heart normal in size.

CAT 24.—Operated on, March 14, 1914. Several knife stab-wounds. In closing operation heart acts splendidly. Killed by anesthesia.

V. AURICULAR APPENDECTOMY

In cats the auricle appendix is of considerable size. It closely resembles a leaf fluttering over the ventricle. Its walls are very thin, and it is not amenable to suture. There does not seem to have been much if any surgical work done in that portion of the heart. The only one we could find was Domenichi,[28] who tied off part of the left auricular appendix. The dog died on the table. We excised the left, the right and then both appendixes.

In all our work excision of the left auricle appendix resulted in the least disturbances, seemingly not any more than if the chest and pericardium had been opened.

After excision of both appendixes no cat lived over three weeks, but we did not use a sufficient number of animals; otherwise I think we might have got some to live on. Post mortem we noticed in these cats great congestion of the lung, and also of other organs. It seems that the excision of both appendixes causes enough interference with the circulation to produce this excessive congestion. The operation was simple. We picked up the appendix with mosquito forceps and tied it off at its base and excised it.

REMOVAL OF LEFT AURICULAR APPENDIX

CAT 25.—Operated on, May 23, 1913. Killed July 17, 1913. Lung adherent to pericardial sac and along chest wound. Heart normal in size, free in pericardial sac. Stump of auricle free and smooth; no enlargement.

CAT 26.—Operated on, May 24, 1913. Died May 30. Infection in the pleural cavity.

CAT 27.—Operated on, May 26, 1913. Died June 1. Infection in pleural cavity.

CAT 28.—Operated on, Sept. 25, 1913. Killed Dec. 15, 1913. Lung adherent to pericardial sac. Heart free in sac. Normal in size. Stump of auricle smooth. Cause of death appeared to be pneumonia.

28. Domenichi: Bull. d. r. Accad. Med. di Roma, 1913, xxxviii, 83.

CAT 29.—Operated on, Oct. 3, 1913. Killed June 18, 1914. Slight adhesions of lung to pericardium. Heart free in sac and normal in size. Interior negative.

CAT 30.—Operated on, Nov. 12. Killed December 12. Lung adhesion to scar.

CAT 31.—Operated on, March 20, 1914. Died March 24. Pulmonary embolism.

REMOVAL OF RIGHT AURICULAR APPENDIX

CAT 32.—Operated on, Oct. 11, 1913. Died October 16. Infection.

CAT 33.—Operated on, Oct. 14, 1913. Killed Dec. 5, 1913. Heart normal in size. Lung adherent to pericardium.

CAT 34.—Operated on, Nov. 12, 1913. Killed Jan. 14, 1914. Slight pericardial adhesions to stump. No external pericardial adhesions.

EXCISION OF BOTH AURICULAR APPENDIXES

CAT 35.—Operated on, Oct. 15, 1913. Died Oct. 30, 1913. Infection.

CAT 36.—Operated on, Oct. 23, 1913. Died Oct. 25, 1913. Acute congestion of the lungs and other organs.

CAT 37.—Operated on, Oct. 27, 1913. Died Dec. 2, 1913. Died from intercurrent sickness.

CAT 38.—Operated on, Oct. 28, 1913. Died three hours after operation. Embolism.

CAT 39.—Operated on, Jan. 31, 1914. Died Feb. 2, 1914. Congestion of lungs and other organs.

MISCELLANEOUS WORK

In working on the heart we could not resist the temptation of listening directly to the organ with the stethoscope. We also examined the heart by tracheal and esophageal auscultation. The direct method was not at all satisfactory, the sounds being muffled and indistinct. The unopened chest barrel is required to intensify the sounds. Through the tracheal tube the heart-sounds could be heard with startling distinctness, when breathing was temporarily suspended. In one cat we heard a faint, soft murmur that could not be heard by auscultation of the chest.

Through the esophagus the heart-sounds are not heard any plainer than by ordinary auscultation. We also tried this in man through a stomach-tube, but the sounds were not very plain.

In some cats we performed multiple operation, such as removal of heart-sac and cardiotomy, cardiotomy and auricular appendectomy, stab-wounds and auricular appendectomy, etc.

CAT 40.—Operated on, May 12, 1913. Small piece resected from left ventricle. Died on the table from acute dilatation of the heart.

CAT 41.—Operated on, May 12, 1913. Operation as above. Killed July 17, 1913. Heart normal in size; lung adherent along line of incision. Internal surface of heart smooth; slight depression along line of incision; firm union.

CAT 42.—Operated on, May 5, 1913. Operation as above. Died from anesthesia.

CAT 43.—Operated on, May 5, 1913. Operation as above. Left auricle was accidently cut and tied off. Killed July 17, 1913. Heart seemed slightly enlarged. Lung adherent along line of incision. Auricle that was partially removed was smooth. Heart incision showed separation of muscle-fibers, leaving a pouch of fibrous tissue.

CAT 44.—Operated on, March 10, 1914. Excision of pericardium; cardiotomy. Killed May 2; adhesions to lung.

CAT 45.—Operated on, March 10. Left auricular appendectomy; cardiotomy; stab-wound; killed April 21. Slight intrapericardial adhesions; heart normal.

CAT 46.—Operated on, March 14. Knife stab-wound. Double auriculectomy. Died March 17 from infection.

CAT 47.—Operated on, March 14. Use of ice on heart.

CAT 48.—Operated on, March 14. Excessive heat on heart.

LUNG RESECTION (UNILATERAL)

This operation would be performed for malignancy, tuberculous foci, actinomycosis, gangrene, etc. The main operative dangers from pulmonectomy are pleural infection and pyopneumothorax from reopening of the tied bronchial stumps. Consequently the object of most of the experimental work has been to devise methods that would as much as possible overcome these operative risks.

The special difficulty is really the closure of the cut-off bronchi, and several more or less successful procedures have been proposed, none of which, however, is fully reliable.

Carrel[29] says that he used only simple ligation of stump with good results.

Probably the best closure is that devised by Willy Meyer,[30] who treats the bronchial stump somewhat like the cut of an appendix vermiformis. One of his reports gives twenty-one total resections with seventeen recoveries.

Robinson[31] using a simple ligation, saved four dogs out of thirty. In total resection there was no recovery. In all his fatal cases he found a great amount of pleural effusion which greatly displaced the heart, fatally interfering with its action. This fluid was sterile. We also observed this in our fatal cases, but we always found this fluid to contain bacteria of various sorts. Some effusion is present, however, in all cases following total lung excision.

Courmont[32] experimented on dogs and rabbits to discover the minimum capacity of lung compatible with prolonged survival.

Friedrick[33] studied the skeletal changes following total unilateral pulmonectomy, noting the attempt, as did several others, of the pulmonectomized side to close in the empty space.

In our work we found in young cats that the lungless side collapsed very quickly so that sometimes in a week there was a marked difference. In older cats these changes come on much more gradually. In order to meet this attempt at cavity obliteration half way, we resected the mediastinum, which in cats is only of the thickness of a leaf, aiming then to have the remaining lung fill the empty space, preventing the marked collapse noticed in the other cats with undisturbed mediastinum. Our results somewhat favor this supposition.

Roentgenograms show very little osseous changes on the lungless side, and cross-section of frozen cat shows the lung moderately distended, almost filling the empty space. The lung-stumps were covered in the different ways mentioned above. The series is too small to declare any preference for any particular method. As in heart surgery the immediate result is simply above all expectations. The animal reacts almost less than from a simple laparotomy. The next few days they are rather quiet and take very little nourishment. If this keeps on after the third day as a rule there is something wrong, either a pleurisy from which they die in from four to six days, or else there is a beginning leakage from a bronchus, later evidenced by gradual increase in body size and alarming dyspnea. Later there may be an extensive general emphysema.

29. Carrel: Ann. Surg., i, 83.
30. Meyer, Willy: Pneumectomy with the Aid of Differential Air Pressure, THE JOURNAL A. M. A., Dec. 11, 1909, p. 1978.
31. Robinson: Ann. Surg., 1908, xlvii, 184.
32. Courmont: Compt. rend. Soc. de biol., 1913, lxxiii, 503.
33. Friedrick: Arch. f. Chir., 1908, lxxxvii, 647.

CAT 49.—Operated on, Oct. 22, 1913. Right lung excised; stump tied with single ligature; died October 29, pyopneumothorax; reopening of bronchial stump.

CAT 50.—Operated on, October 22. Operation as above. Died November 25 from intercurrent disease; slight fluid in pleural cavity which was greatly collapsed; opposite lung normal; heart normal.

CAT 51.—Operated on, October 23; resections of right lung and mediastinum. Killed November 30. Right side only slightly contracted. On inflation lung filled almost both sides.

CAT 52.—Operated on, December 2. Same operation. Died December 16, sloughing of bronchial stump, pyopneumothorax.

CAT 53.—Operated on, Dec. 13, 1913. Excision of right lung. Killed June 10, 1914. Osscous changes slight.

CAT 54.—Operated on, Feb. 27, 1914. Removal of right lung; double ligature of stump. March 21 reoperated on, one lobe of left lung removed; died two hours later from pneumothorax.

CAT 55.—Operated on, March 2, 1914. Operation as above. Left stump treated with Meyer method. Died March 5, from pleurisy.

CAT 56.—Operated on, March 19. Same operation; double ligature of stump. Died March 23 from pleuritis.

CAT 57.—Operated on, April 1. Same operation, but stump covered with lung tissue. Died March 3 from intercurrent disease. Some fluid in pleural cavities, otherwise negative.

CAT 58.—Operated on, April 1. Same operation. Died April 5 from pyopneumothorax; opened bronchial stump.

CAT 59.—Operated on, April 1. Left lung and mediastinum excised and stump covered with lung tissue. Died May 10 from distemper. Slight pleural effusion.

CAT 60.—Operated on, April 21. Same operation. Died April 24 from pleuritis.

CAT 61.—Operated on, April 21. Same operation. Died April 22 from pulmonary embolus.

CAT 62.—Operated on, April 22. Same operation. Willy Meyer method. Killed May 2. Pleural cavity smooth; chest not very much collapsed, if any.

CAT 63.—Operated on, April 22. Same operation. Stump covered with lung tissue. Killed June 10. No collapse of chest. Pleural cavity smooth.

CAT 64.—Operated on, April 28. Same operation. Died May 1 from pulmonary embolism.

INTRATHORACIC SECTION OF TRACHEA

The theoretical indications for a resection of the trachea in the thorax could not be numerous, possibly a stricture or a localized tumefaction. As far as I know this is seemingly the first recorded attempt of such experimental research.

The technical difficulties are great; the dangers are numerous. The shock is far greater and the death rate infinitely higher than in any other intrathoracic operation. A great number of the animals died on the table apparently from respiratory failure in convulsive seizures with extreme opisthotonos strongly resembling symptoms of strychnin poisoning.

Some of these animals we were able to tide over temporarily with prolonged artificial respiration, since we found the heart acting good, although respiration had completely ceased. This respiratory failure might have been a temporary reflex inhibition of the respiratory center, incidental to the cutting of the trachea, especially the posterior fibromuscular part which (in this region) may contain important hitherto unknown nerve-tracts.

This fibromuscular part of the windpipe is undoubtedly of special importance in bringing about certain contractive motions of the trachea, as in excessive expiratory efforts I have seen the tube contract and then the ends of the tracheal rings were closely

approximated and may possibly even overlap. There is really a bow-string action of each tracheal segment. I do not know whether this was observed before. Those muscular fibers between the ends of the cartilaginous bows, however, were not placed there for simple ornamentation.

Except in one or two cats the depression following the operation was very pronounced, and as a rule they were very quiet for the first two days. The cause of death of those that survived the operation was pneumothorax, pleurisy, pneumonia, collection of mucus at site of section, and pulmonary embolism and sloughing of tracheal rings. Out of twenty-five operations we succeeded in saving only one cat—Cat 86.

The thoracic incision was made in the second or third intercostal space and one or two ribs fractured at inner end of wound. The lung was pushed out of the way with sponges, then the trachea was dissected free and raised carefully on blunt hooks. This must be done with care; otherwise the soft coat of the trachea may easily be torn. The tracheal catheter is now pushed beyond the proposed site of section and a catgut thread tied around the trachea above and below. The air-tube is then cut or rings excised by cutting around the catheter and between the rings. The tube is then sutured with interrupted fine silk prepared with petrolatum. Trachea is then replaced and covered with the surrounding areolar tissue.

CAT 65.—Operated on, Dec. 10, 1913. Died Dec. 17, 1913. Infection entering through line sutures, sloughing of trachea.

CAT 66.—Operated on, Jan. 29, 1914. Section of trachea removed from another cat placed around trachea. Died January 30 from imperfect apposition.

CAT 67.—Operated on, Jan. 31, 1914. Died same day. Leakage of air collapsed lungs.

CAT 68.—Operated on, Jan. 31, 1914. Died immediately after operation from respiratory failure.

CAT 69.—Operated on, Feb. 2, 1913. Died February 4 from pneumonia. Lungs highly congested.

CAT 70.—Operated on, Feb. 3, 1914. Died immediately from respiratory failure.

CAT 71.—Operated on, Feb. 4, 1914. Died February 5 from collapse of lung; leakage of tube.

CAT 72.—Operated on, February 5, and died February 6 from pneumothorax.

CAT 73.—Operated on, February 5, and died February 7 from congestion of lungs.

CAT 74.—Operated on, Feb. 6, 1914. Died same evening from leakage and collapse of lung tissue.

CAT 75.—Operated on, February 6. Cat died on table from respiratory failure.

CAT 76.—Operated on, Feb. 9, 1914. Died same night. Embolism of pulmonary artery.

CAT 77.—Operated on, Feb. 9, 1914. Died February 10 from occlusion of trachea with mucus.

CAT 78.—Operated on, Feb. 10, 1914. Died one hour after operation; acted as if it had convulsions.

CAT 79.—Operated on, Feb. 11, 1914. Egg-membrane placed around trachea. Died February 13 from occlusion of trachea.

CAT 80.—Operated on, Feb. 12, 1914. Died on the table from respiratory failure.

CAT 81.—Operated on, Feb. 12, 1914. Surrounding fascia loosened and sutured over trachea. Died February 14; trachea and surrounding tissues looked good; lungs congested.

CAT 82.—Operated on, Feb. 13, 1914. Died February 15 from pulmonary embolism.

CAT 83.—Operated on, Feb. 17, 1914. Membranes and fascia sutured over trachea; ether passed through hot water. Died February 19 from embolism of pulmonary artery.

CAT 84.—Operated on, Feb. 17, 1914. Fascia sutured over trachea; air and ether warmed. Died same day; non-approximation of trachea.

CAT 85.—Operated on, Feb. 17, 1914. Fascia sutured over trachea where sectioned. Died while on table.

CAT 86.—Operated on, Feb. 18, 1914. Fascia sutured over union. Killed June 14. Small adhesion of lung to chest wall. Union of trachea perfect, only slightest contraction at site of anastomosis. Small spot of granulation tissue on the mucosa interiorly. Cat was in perfect condition when killed.

CAT 87.—Operated on Feb. 18, 1914. Ether and air warmed, passing through coil immersed in hot water. Fascia sutured over place of section. Died February 19 from apposition, lumen became plugged.

CAT 88.—Operated on, Feb. 19, 1914. Died Feb. 21, 1914. Became plugged with mucus.

CAT 89.—Operated on, April 16, 1914. Died April 19, 1914. Small quantity of thick pus. One lobe of lung gangrenous. Pneumogastric nerve tied in one ligature.

SUMMARY AND CONCLUSIONS

The death-rate in the heart work was 38 per cent.; in the lung research 50 per cent., and in the tracheal experimentation we succeeded in saving only one out of twenty-five.

Cats without heart-sac show very little, if any, disturbance.

If at the end of an operation on the heart the organ is acting poorly it is almost always fatal to suture the heart-sac.

The making of a new heart-sac from transplanted tissue is not very promising.

Opening in pericardium should not be made too near the base of the heart, as sewing it may cause too much traction on vessels and incidentally on important centers.

Extreme traction on heart is one of the greatest dangers in heart surgery.

Through-and-through aseptic puncture wounds, unless through certain danger regions, create only a temporary disturbance, varying, of course, with the type of the insulting agent and the extent of damage.

Auscultatory findings were few in the operated cat heart.

The marvelous recuperative power of the heart is demonstrated by the recovery from multiple extensive operations on the organ.

The local atelectasis produced by pressure from sponges should be remedied by forcible expansion of lung before closing the chest.

The collapse of the chest wall in unilateral excision of the lungs is somewhat counteracted by mediastinal removal.

Certain contractile movements of the trachea are observed in excessive expiratory efforts.

In section and suture of the intrathoracic trachea a number of animals die from respiratory failure (seemingly reflex).

At the present time some of this research may seem ridiculous and void of all practical application, but surely we are not yet at the end of our resources. The human race is still young, only a few hundred thousand years old, and in untold centuries to come work that now seems unfeasible might then be fairly well mastered.

As we now stand, however, there are manifold dangers to overcome in the chest work, and the indications for surgical intervention in thoracic disorder will have to be a little more clear cut than those on which we now cheerfully invade the right iliac fossa.

I wish to extend my thanks to Dr. A. Rahe and E. Wichtemas and Miss H. Nelson for valuable assistance.

1230 East Sixty-Third Street.

ABSTRACT OF DISCUSSION

DR. JOHN B. MURPHY, Chicago: I feel that as a prerequisite to graduation, every medical student should do experimental work on the arteries and on the chest cavity. A surgeon has to deal from the very beginning with hemorrhage, with blood. He should become familiar with blood and particularly with the tubes through which blood flows. In 1896 when I did the first end-to-end suture of the artery which had ever been accomplished in a human subject, I had then been working two years experimentally with the blood-vessels. A man can do no work which will give him such poise as that of arterial suture. The work of Dr. Werelius is an inspiration. It is the most important thing that has so far been brought before this section. Why? Because it stimulates us to do new things; to make ourselves familiar with the technical complications and conditions that can arise in so many fields of surgery. There is no question in my mind that it will be but a short time until some of these improbable or even now apparently impossible conditions will be turned to a valuable purpose. When I succeeded in making end-to-end sutures I did not feel that the time would come when a whole day would be devoted to arterial suture as was recently done in one of the great surgical congresses. It is not the individual artery that one wants to or needs to suture, but it is to have the confidence that one is master of the situation and that one can meet any emergency of hemorrhage in a life-preserving way, not alone for the whole body, but for the limb in its proportion. In 1893 or 1894 a surgeon found, in operating on an appendicular abscess, that he was in the external iliac artery. He was a master surgeon; he sutured that artery in the presence of the infection and saved the life and limb of that patient. Conditions of this kind will arise not infrequently and will be of the utmost value to the practical surgeon. I read in an article on the surgery of the chest, that the first lung was opened in 1498 by a bull in Bologna—not a papal bull but an animal. The lung was extracted through the opening of the chest. It was kept outside of the chest, it desiccated and the man survived, and it has taken four hundred years from that time for the skilful surgeon to make himself at all familiar with the removal of the lung, which is not very complimentary to us as original investigators. It is just such work as that of Dr. Werelius that will stimulate us to make the lung and the heart a familiar field for operation.

DR. E. WYLLYS ANDREWS, Chicago: Modern surgery has not lagged behind so much in chest and heart work. I remember the monumental compilation of Ricketts of Cincinnati; I remember that De Forest Willard, in a long series of experiments, demonstrated that it was possible to remove a lobe of the lung, or the whole lung, from an animal and have the animal survive; to open the bronchus in a dog and remove a foreign body artificially introduced. We know the surgery of the mediastinum has been carried as far in the hands of Dr. Willy Meyer of New York as in any clinic in the world. But when we think of the possibilities of lung and cardiac surgery, of cutting down and operating on the lung and the heart, the question arises whether the greatest value we are to get from all this experimental and clinical work is not to be indirect. Whether it will not resolve itself into the question of how to open the chest successfully, how to do it freely and how to handle blood-vessels, as in pulmonary embolism, or the esophagus in cancer. Numerically speaking, the cases of heart surgery will be small and possibly the excision of lungs very rare. Possibly cases of lung surgery will not numerically amount to as much as cases of mediastinal surgery, or opening the bronchi, or of diaphragmatic hernia which are all incidental to our learning how to operate successfully in this line of experimental work. We see how freely we may, even after having seen the work of Sauerbruch, open the chest without the Sauerbruch or any cabinet or differential pressure and without fear of collapsing the lungs. We learn by making a long incision, with powerful retractor blades between two ribs, to get immense openings into the chest and to operate freely in the mediastinum. In a large service in the Cook County Hospital we have had an unprecedented number of such cases. We have had five patients with congenital stenosis of the esophagus in Dr. Richter's clinic alone. All were operated on and, as it proved, unsuccessfully. We have had several successful cases of resection of the esophagus for carcinoma or stricture. You remember the beautiful work of cutting down on a rupture of the diaphragm and hernia by Cranwell after a stab wound of the diaphragm. I reported five cases: three patients died and two recovered. We have completely changed our idea as to where to cut in these cases.

DR. WILLY MEYER, New York: Dr. Werelius' paper is full of interest. It deals with thoracic surgery from the experimental point of view. I speak from the clinical point of view, concerning surgery of heart and lungs in man. Trendelenburg's operation for pulmonary embolism will, it seems, promise better results, if done under differential pressure with longitudinal division of the sternum (Kehn). Cardiolysis for fixation of the heart and pericardium, in a condition usually fatal without operation, can be well done by the same route, particularly in children. Extirpation of the lung in the healthy dog is a simple procedure. The lobes are always separated. After ligation of the blood-vessels the bronchial stump needs air-tight closure. We treat the bronchial stump as that of the appendix—crushing, ligature, top suture—and consider this a safe procedure. Of twenty-one dogs thus operated on we saved seventeen. The resulting cavity in the chest on firm closure remains filled with air, which is gradually absorbed. Frozen sections of dogs killed at certain periods after pneumectomy, the vascular system having been injected with a formaldehyd solution (Dr. Francis C. Wood), have proved this. The gap is slowly filled by the opposite lung, heart and big vessels, and the rising diaphragm. The sick human being, however, is different from a healthy dog. In human beings the sensitiveness of the pneumogastric nerves, also of the sympathetic system needs consideration. Sudden, unexpected, sometimes fatal reflexes occur. We must learn to overcome these. Cocainization promises help. The next difficulty is found with the bronchial stump. There, too, I believe, further practical experience will show that it is best to deal with the stump in man as we have done in the dog, but its mucosa is often infected. It needs thorough disinfection during operation. Lately I had to resect the left lower pulmonary lobe in a woman for multiple bronchial fistulas. Twice she had been operated on in other hospitals. We resected the lobe, taking out a wedge-shaped piece which carried the bronchial fistulas, and closed each remaining portion of the lobe separately by a continuous inverting suture. The patient recovered nicely. One bronchus opening has, it seems, not yet definitely closed. I feel that had I disinfected each of the bronchial lumina during operation before suturing, the one reopening would likely not have occurred. The tendency of the bronchial stump to retract is also important. If there be no adhesions and the stump leaks while the thoracic cavity is closed air-tight, the deadly pressure—pneumothorax—will develop. Postoperative drainage of the pleural cavity will most likely overcome this danger. I believe that more frequent drainage after intrathoracic operation, always of course, on strict indication, will work for more rapid progress, not only after radical operations for lung disease, but also after operations on the esophagus.

The Making of a Good Surgeon.—The education of a surgeon is always incomplete if he is not a good anatomist, physiologist and pathologist to start with, and continues to be so to the end, and it is only by those who will take the trouble to attain and maintain this knowledge that any real surgical advance can be made. . . . The days when surgery was a mere handicraft are past, and to be able to operate well, though a useful accomplishment when properly applied, may make a man a curse instead of a blessing to the community in which he practices.—Rutherford Morison, *Canadian Med. Assn. Jour.*

NERVOUS AND MENTAL DISTURBANCES FOLLOWING CASTRATION IN WOMEN*

ALFRED GORDON, M.D.
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It is a very well-known fact that ovarian tissue has a certain influence on the development of the body. Removal of the tissue before puberty arrests or prevents the development of the uterus; removal after puberty prevents menstruation. Removal of it is followed by atrophy of the breasts and arrest of general physical development. On the other hand, after removal of ovaries, anatomic changes have been observed in other glands, namely, hypophysis, thyroid, adrenals. In the hypophysis, for example, there is an increase of its size (hypertrophy) with an extraordinary number of eosinophilic cells and dilatation of its blood-vessels.[1] Goldstein[2] has recently reported a case of acromegaly which developed after castration. In the thyroid there is an increase of the acini, also dilatation of the follicles and increase of the colloid substance.[3] In the adrenals hypertrophy has been observed by many authors. The same histologic modifications which are observed after castration in women have been found experimentally on animals.

It is also very well known that after transplantation of ovarian tissue into the abdominal cavity in women previously castrated, the phyiologic functions of the genital organs are restored. The latter has also been observed in a number of cases in which castrated women have been treated by opotherapy. Dixon[4] speaks of great improvement of all symptoms following oophorectomies obtained from the internal use even of small quantities of ovarian tissue. Menopause may thus be prevented.

Whether the disturbance of genital function after oophorectomy is due to the suppression of the internal secretions supplied by the ovaries according to the conception of Brown-Séquard, or to the presence in the ovaries of adrenal substance as Sajous wants it, it is as yet difficult to say with any definiteness. It is equally difficult to estimate the rôle played in the above-mentioned disturbances by other glands, since the latter have been found altered in a large number of cases. The physiologic interrelation between various ductless glands is a well-known fact. In cases of acromegaly and gigantism, for example, alongside the changes in the pituitary gland changes in the genitalia also were not infrequently noted, such as atrophy of testicles or ovaries. Experimental castration has been followed by changes in the hypophysis. On the other hand, we are familiar with the frequent occurrence of enlargement of the thyroid at puberty and pregnancy when physiologic changes occur in the generative organs. The genital organs and the thymus are also physiologically influenced by one another.

In view of this intimate relationship between various glands and of our want of knowledge of the exact significance of the relationship, it is impossible as yet to say with any degree of certainty what particular gland with internal secretion plays the most conspicuous rôle in the production of certain morbid phenomena, since several of them are altered anatomically at the same time.

As to the physiologic effect of ovarian tissue on the economy, our knowledge is quite limited. From the investigation of Loewy and Richter,[5] of Neumann and Vas,[6] Dalché and Lépinois,[7] of Sauvé,[8] and a few others we know that ovarian extract is an oxidizing agent; it enhances metabolism, it increases the hemoglobin content of the blood. Robin and Binet have shown that during the physiologic changes in the ovaries, namely, during menstruation, there is an increase of respiratory exchange. This meager information concerning the influence of ovarian tissue on the organism cannot, of course, explain the great variety of morbid manifestations observed during the physiologic menopause or following bilateral oophorectomy. Nevertheless, the fact is that clinically we meet with a certain group of phenomena which are evidently in connection with the female generative organs. Without entering into further discussion of the pathogenesis of these phenomena, which after all will be only speculative, let us consider only the nervous and mental disturbances which I succeeded in observing during the period of several years in a series of 112 cases.

The large majority of patients (eighty-nine) had the ovaries alone removed; the rest (twenty-three) had ovaries and uteri removed. In a certain number of cases (thirty-seven) oophorectomies were performed through errors of diagnosis. As the patients complained of vague neurotic pains in the abdomen and only gynecologists were consulted, the productive genitalia were considered as the direct cause of those disorders.

Let us consider first the latter group of cases.

Thirty-four young women suffering from various manifestations of neurasthenia, hysteria or psychasthenia complained among other symptoms also of vague disturbances in the abdomen. Surgeons at once incriminated the ovaries and removal of the latter was insisted on. The results were as follows: In a small number of cases (nine) there was at first an improvement in the preexisting functional disorders. Rapidly, however, during convalescence following the operative procedures the former conditions returned. In the remaining twenty-five cases there was no improvement whatever. In all the cases the former nervous and psychic phenomena have become aggravated in the weeks and months following the operations.

The obsessions from which several women suffered prior to the oophorectomies became since then more persistent and covered a larger field of morbid ideas than heretofore. Those who suffered from hysterical paroxysms began to have them more accentuated and more frequently. The former neurasthenic individuals developed a deeper asthenic state with a greater number of hypochondriac tendencies than heretofore. Several patients among the psychasthenics became so ill that temporary confinement to institutions was unavoidable. Some of these patients are still seen occasionally by me, but there has been no abatement of the condition; on the contrary, the latter is more

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1. Cimoroni: Policlinico, 1907, p. 16. Kon: Beitr. z. path. Anat., 1908, xliv, 233.
2. Goldstein: München. med. Wchnschr., April 8, 1913.
3. Cecca: Soc. méd.-chir. de Bologne, 1904. Parhon with Goldstein: Spitalul, 1906, xxvi.
4. Dixon: Practitioner, May, 1901.
5. Loewy and Richter: Berl. klin. Wchnschr., 1899, xxxvi, 350.
6. Neumann and Vas: Monatschr. f. Geburtsh. u. Gyn., 1902, xv, 433.
7. Dalché and Lépinois: Bull. gén. de therap., 1902, clxiii, 10.
8. Sauvé: Paris. méd., 1911, No. 45, p. 400.

persistent and more profound, so that at times it appears to make one suspect absolute incurability. Three of this group of patients presented before the operations no distinct symptoms of the aforesaid functional nervous diseases. They complained of vague nervous symptoms, such as frequent pain in the abdomen, back and head, of various paresthesias, of anorexia, constipation or diarrhea. They were referred for their complaints to gynecologists who advised indiscriminately surgical intervention, that is, oophorectomy. The operations were uniformly successful. Shortly after the operations various nervous disturbances made their appearance. Irritability, more or less pronounced; highly nervous state; peculiar and sometimes bizarre relations to surroundings, such as inability to be in accord with others or inability to stand the least contradiction; changeability in the mood at various times on the same day; restlessness, tendency to move about, to travel; great and sometimes extreme tendency to complain about others; finally insomnia, loss of appetite or else voracious appetite; in some cases traces of sugar in the urine—all these manifestations have been observed in the three patients whose previous medical histories showed a total integrity of the nervous system.

In all the thirty-seven cases considered here we therefore find that oophorectomies were followed by decided nervous disturbances of a various character. Either the preexisting morbid phenomena became accentuated, or else new manifestations developed directly on the removal of the generative organs. In this connection it is interesting to note that the removed organs were found to be normal in every one of the cases in which operation was performed. The diagnosis was evidently erroneous. It proves beyond doubt that indiscriminate surgical intervention in cases of vague but persistent complaints of a nervous nature is a wrong procedure which may lead to regrettable consequences.

In the remaining seventy-five cases the reproductive organs were found to be diseased, either on one or on both sides. The surgeons performed in all of them radical operations. Complete hystero-oophorectomies were advised and accepted. Both diseased and healthy portions of tissue were removed. Prior to the operations the patients complained of symptoms, incidental with diseased viscera, such as pain in the abdomen and back, constipation, and general nervousness. The removal of the diseased organs removed the localized discomfort, but in the months following the operations, symptoms of a more distressing nature began to develop. In the largest majority of my patients the former nervousness not only remained but became accentuated. Symptoms observable in neurasthenia, psychasthenia, especially in anxiety neurosis, gradually made their appearance. Insomnia was a prominent feature. Obsessions of various nature were the next pronounced manifestation. They concerned especially fear of death, of becoming insane, of impending calamities. The obsessions existed either single or multiple. Restlessness, discontentment with everybody and everything, tendency to quarrel, to contradict, desire to control, to dominate, are all symptoms observed in some of my patients. In other patients there was actual incapacity for mental work; they were unable to concentrate their thoughts in writing or in conversations; they lost all power of initiative, they lost interest in all absorbing subjects. They knew nothing but their ailments and their complaints. Some of the patients eventually developed the most pitiful picture: there was a complete loss of desire for enjoyment; they confined themselves to their rooms with not the least desire for outdoor life; their homes were neglected, their children were abandoned to themselves; former clean habits changed radically: untidiness, uncleanliness, nonchalance became conspicuous. Another group of patients developed imperative ideas of traveling which were probably due to the extreme restlessness and nervousness. This eccentricity, along with other peculiarities in dealing with the surroundings, rendered the individuals incapable of taking care of their families and of their homes. A small group of patients, after passing through a phase of disturbances as observed in the other patients, gradually developed such a state of mentality that their removal to an institution was found unavoidable. While they presented no delusive ideas, no hallucinations, no evidences of dementia, and no paradoxical reasoning, nevertheless the extreme restlessness, insomnia, anxiety about the future, inability to live peacefully with others and to content themselves with the attention given them by others, the great tendency to quarrel, the episodic outbursts of ungovernable anger with impulses to attack—all these morbid manifestations rendered the lives of those who came in contact with these patients intolerable and isolation of the latter became imperative.

CONCLUSIONS

An analysis of all the cases grouped in my study permits me to draw the following conclusions:

1. Removal of the reproductive organs in women causes disturbances in the domain of the nervous system. These disturbances are of a purely functional nature.
2. The disturbances are somatic and psychic.
3. The psychic manifestations, while individually they belong to any of the varieties of psychoneuroses, nevertheless in their ensemble do not constitute any of the well-established classical forms of psychasthenia.
4. True insanities are not observed.
5. The generally observed symptoms are: restlessness with a tendency to move from place to place; difficulty of self-control; dissatisfaction with all and everything; difficulty of finding contentment in one's own efforts; want of interest in all absorbing subjects and objects; indifference, indolence and pessimism. Sometimes there are outbreaks of anger with a tendency to attack. Among other symptoms may be mentioned: insomnia, gastro-intestinal disturbances of a functional nature, headache, vague pains or paresthesias, also occasionally glycosuria; tendency to obesity is also observed in some patients.
6. While the psychic manifestations are sometimes of a very disturbing nature, nevertheless they do not present the characteristics of genuine psychoses. For example, indifference and want of interest in surroundings lack the depth of those of melancholia or of dementia. Restlessness, which is so frequently observed here, lacks the characteristic features of exaltation in the motor sphere observed in cases of mania. As mentioned above, while individual symptoms of my cases resembled those of psychoses, the entire picture of each case lacked the depth and definiteness of any of the forms of insanity. Some of my patients had to be removed from their surroundings and isolated, not because they were insane in the proper sense of the term, but because of inconveniences caused

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by them to others. Besides, the subsequent histories of the last category of patients as well as of any other patient of my entire series proved at no time the existence or eventual development of true psychoses. On the other hand, it is striking that the morbid phenomena persist with a remarkable obstinacy; at times they become more accentuated, at others some improvement is noticeable, but then it is only temporary. Some of my patients have been under observation during a period of ten years and the condition still persists unaltered.

7. Individuals who presented various manifestations of psychoneuroses before they fell into the hands of surgeons, had their psychic phenomena decidedly aggravated after the uteri and ovaries or only ovaries were removed.

8. As in the removed organs healthy portions of tissue were invariably found, it is to be supposed that the removal of the latter is in some relation to the morbid phenomena observed after the operations.

9. The logical conclusion seems to be that one must be very cautious in advising operative procedures on the generative organs and the tendency should be to preserve as much as possible of any amount of normal tissue found in the uterus or ovaries.

10. No operation should be advised on healthy organs if a woman complains of vague nervous disturbances.

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ABSTRACT OF DISCUSSION

DR. WALTER B. SWIFT, Boston: If, as has been lately held, the etiology of dementia praecox shall prove to be a faulty elaboration of the secretion of the testicle, I see no reason why a similar disease in women could not derive its etiology in a faulty secretion of the ovary. I consider that Dr. Gordon has gone far in the determination of this new symptom-complex.

DR. JOSEPH M. AIKIN, Omaha: For the last eight years I have observed just what Dr. Gordon has been telling us with reference to surgery in that class of cases. I tried to collect from my own files and those of some of my associates, sufficient data on which to present a paper on the subject, but the evidence was too indefinite for scientific use. I have experienced the results he has pictured. While hardly germane to this subject, permit a reference to surgery in cases of epilepsy. I have seen a number of cases in which the question has come up of removing the ovaries or the uterus and the ovaries, with the idea of giving the patient relief from the epileptic convulsions. In every case I have insisted that, unless there is pathology in the pelvis warranting surgery without regard to the epilepsy, it should not be done. If the epileptic convulsion occurs only at the time of the menstrual period, relief by surgery is very often obtained. If the convulsion occurs during the intermenstrual period no relief will come to the patient from surgery.

DR. FRANK R. STARKEY, Philadelphia: Dr. Gordon has brought out a point in which I am particularly interested, namely, the multiglandular or polyglandular nature of disturbances of this kind. The terms, "ovarian syndrome," "thyroid syndrome," "pituitary syndrome," etc., will soon pass away. Although any of the organs of internal secretion may be so involved as to make its deficiency most conspicuous; in reality all of these organs are affected when one is involved. When we remove both ovaries, we take away from the woman two organs of generation; but we also take away from her the ability to form the internal secretion of the ovary which is important to her economy and assists in oxygenation and metabolic processes generally. We remove from her the balancing function of the ovary, we rob her of the influence of the corpus luteum, change the chemistry of her tissues, precipitate at once the menopause and the nervous and mental phenomena incident thereto, with a complete change in her entire being. Adynamia and lack of efficiency are the keynote of this condition; relaxed muscles, visceroptosis and mental and nervous depression follow. The condition is always polyglandular. Shall we give these patients extracts or the substance of single glands? No. Shall we give them tablets or other preparations of commerce prepared from the glands of animals raised for food purposes and castrated in their youth to improve the quality of their flesh for eating? No, for these animals are pathologic themselves and their glands are especially deficient. The sooner we recognize that we must always use glands from unspayed animals and treat the entire chain of glands of internal secretion, the sooner will we treat this class of patients intelligently.

DR. WILLIAM M. LESZYNSKY, New York: About twenty-five years ago, there were a number of gynecologists in New York who were really obsessed with the idea that every woman who appeared with inexplicable nervous symptoms should have her ovaries removed. The result was very disastrous, as many of us remember. Fortunately, such methods in a large measure were soon discontinued. The psychoneurotic manifestations mentioned by Dr. Gordon are unusual or rarely occur after oophorectomy for ovarian disease, unless the patient is of a pronounced neurotic temperament. I had thought that the final words on this subject had been definitely expressed many years ago.

DR. HUGH T. PATRICK, Chicago: My experience confirms that of Dr. Gordon relative to the results which have followed operations on women; but, today, the question is not as to the inadvisability of removing normal organs, but abnormal organs. The natural attitude of operators is this: When there is obvious organic trouble the diagnosis seems to be very simple; the nervous disorder must be due to that organic disease. As a matter of fact, however, that conclusion does not follow. Because a woman has a tear in her uterus, a prolapsed uterus, a retroversion or a cystic ovary, we should not conclude that her nervousness is due to abnormalities in the pelvis. So it is not a matter of operating on normal pelves, but in pathologic conditions. My experience in most cases of obvious pathologic conditions in the pelvis is that there is very little direct connection between this pathology and the nervous disorder. Those are the cases which need most protection at our hands, because really the up-to-date gynecologist is exceedingly conservative.

DR. ROBERT T. MORRIS, New York: First, we have patients whose condition is that of manic-depressive insanity, particularly with the mild cyclothemias, in which there is pain in the ovaries, especially in the depression stage of the cycle. If these patients are operated on by gynecologists who are not psychiatrists, the patient may subsequently have insanity diagnosticated by some one else for the first time, and ascribed to the effects of operation. The depressive phase may have been made more intense by the pomp and circumstance of the operation than it would have been in a mild cyclothemia. We have to distinguish here that particular form of insanity following removal of the ovaries, but not dependent on the operation. In another class of cases in which we have various stigmata of decadence—arrested development, high arch of palate, and others which I do not need to classify here, we have patients in whom, as a phase of their neurasthenic condition, manifestations of pain commonly occur in the ovaries or in the pelvis, or the pelvic ganglia. Now, if we remove the ovaries from those patients we may have, in some patients, the nervous phenomena which have been so accurately described. In another class of patients the removal of the influence of the internal secretion of the ovaries is evidently beneficial to the patient. But we cannot inform any patient or physician in advance in which case the patient will become permanently injured by removal of the ovaries, and in which there will be a good deal of benefit; and I state that fact directly to the physician when these cases are seen in consultation. I do not operate in any such case except after thorough consultation with a competent neurologist or psychiatrist, and for ovaries which are the seat of definite degenerative changes. I have followed many

cases for a good many years, and have found that some improved and some were made worse. It is important to remember that we have fundamentally a patient with a general neuropathic tendency. I have sometimes made ovarian grafts after the ovaries have been removed, and have seen relief from nervousness in consequence. While an ovarian graft is of benefit for a short and sometimes for a long period, we have to deal with the known fact that the tissues of one person are inimical to those of another. Some patients will in a few weeks absorb the foreign graft while another individual is quite tolerant of it and will apparently be saved from the effects of loss of the internal secretion of the ovaries for months or years. Grafting is a matter of comparative tolerance on the part of the tissues of one person toward those of another, when we are trying to overcome the ill effects of removal of the ovarian secretion.

DR. CHARLES R. BALL, St. Paul: The correlationship which exists between these various glandular structures is a most intimate and complex one. Thus far it presents, in the majority of the cases, a Chinese puzzle. We are very much in the position of the man who is trying to open a safe without the combination. There is no doubt but that the thyroid and pituitary secretions exercise a restraining and modifying effect on the activity of the testicles and ovaries. Recently I have had under observation the case of a boy 13 years old who, when 11 years of age, sustained a severe accident to his head. He was unconscious for twenty-four hours, complained of pain and headache and still complains of them. The remarkable thing is that, within a period of a few weeks after his accident, he began to take on weight, became sluggish in his habits, would not go out and play as formerly, but would sit inactive and apathetic around the house. His parents tried sending him to school but his teachers reported that they could not get him to study or concentrate. In the fifteen months he has gained 55 pounds in weight. His facial expression, the appearance of his skin and his enormous increase in weight give him the appearance presented by a case of myxedema. His breasts are enormously developed. His abdomen is protruding and the contour of the hips with the layers of fat over them suggest the feminine type. It has been pointed out that sometimes pregnant women have such a coarsening of the lips, the face and thickening and clumsiness in the fingers, as is seen in cases of acromegaly. Also, the eunuch is a good illustration of this influence, for being castrated when young, these individuals sometimes grow to enormous size.

DR. CHARLES H. HUGHES, St. Louis: The expression, *post hoc, ergo propter hoc*, is about the keynote of the discussion. With surgery, until quite recently, finding a local disease, it was the rule to conclude that operation was necessary even though the local disease was only a congestion which manifested itself as a secondary condition in connection with hystero-epilepsy for example. The ovaries can become congested as well as the brain, and I know an individual who defined hystero-epilepsy as ordinary persistent periodic epilepsy in a hysteric, and, finding therewith a congested ovary, he operated on that patient in the hope of curing her hystero-epilepsy, but failed. In the earlier days of the discussion of this subject (and I speak in vindication of my own past record with regard thereto), the *Alienist and Neurologist*, published at that time, took the same attitude of caution as to operation for those neurotic conditions that we are verging toward to-day. We are becoming cautious, and we do not say now that, given a disease of the ovary or of the uterus, *post hoc, ergo propter hoc*, but we make some inquiry as to the other conditions present or antecedent. The suggestion made by Dr. Morris that, in these cases, a neurologist might profitably be consulted, is a pertinent and timely one, and so also a psychiatrist and an alienist might be consulted. The disease that is apparent does not always indicate the brain condition. You hear little now of Baker-Brown or of his method of clitoridectomy. It formerly was claimed by some that oophorectomy was a justifiable surgical procedure if epilepsy was detected because epilepsy was such a grave disease that, whether the ovary was normal or abnormal, it ought to be taken out. Our surgeons do not practice on that line now.

DR. ALFRED GORDON, Philadelphia: It is important for any medical man to have some knowledge of neurology. Dr. Patrick said that we now see very little of those surgeons who operate on every patient of this kind. My experience has been more unfortunate. Even to-day I see approximately the same thing I saw eight or ten years ago. A great many surgeons, when patients come complaining of pain in the back or abdomen, do not yet consult a neurologist as Dr. Morris would, but at once operate on the genital organs. The belief of the ancients that functional nervous disorders come from the uterus finds its modern application in the work of psychanalysts who will say that sexual traumas have a great deal to do with psychopathic phenomena. It is for the neurologist to express opinions in these matters and to instruct the surgeon how he should go about his work. Dr. Leszynsky well said that surgery in these cases should be the last resort.

Dr. Patrick stated that even if a patient has a tear or prolapse of the uterus or disease of the ovaries, this does not mean that the pain and bachache and headache and neurotic phenomena belong to the uterus or ovaries. Certainly not. The surgeon does not know all that enters into the make-up of the individual; he does not know under what circumstances the condition has developed. Dr. Patrick also spoke of removing healthy or diseased ovaries. Every patient who presents herself to any medical man complaining of pain in the back or side or in the abdomen should not be operated on immediately. Whether or not a woman who is already suffering from a psychosis should have her reproductive organs operated on for the cure of the psychosis, there is to-day a tendency on the part of many surgical men of eminence to operate on these patients. I have seen cases of that kind. In fact, a surgeon-in-chief of a hospital for the insane in Paris is one of those claiming that maniacal depression and excitement can be removed by operative procedure on internal organs. On reading the cases in detail, however, you find that he fails to recognize that there is any relation between the indication for operation and the depression or whatever other form of psychosis the patient suffered from. The object I had chiefly in view was to induce neurologists and psychiatrists to express an opinion on this important subject. The plea that I make before the profession is that in every case when a woman complains of vague or nervous or psychoneurotic symptoms, operations should not be done hastily.

TUBEROUS SCLEROSIS AND OTHER UNUSUAL FEATURES OF EPILEPSY *

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Although epilepsy is a most ancient disease, our knowledge of it in many respects is quite meager. And yet one of the greatest advances ever made in neurology was made with the establishment of the type of this disease which we know as jacksonian epilepsy. While the recognized manifestations of epilepsy are very numerous, there is still much of its etiology that remains a mystery. Of vast importance in the development of many cases is heredity, but the precise extent of the part this plays must always remain uncertain. In some instances we are confident that the cause is encephalitis dependent on the infectious diseases and sometimes it is due to traumatism, syphilis or brain tumor. Occasionally epilepsy is

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† From the Pennsylvania Epileptic Hospital and Colony Farm and the Department of Neurology of the University of Pennsylvania.

observed to follow fright or other mental shock, but the manner of such influence we cannot understand except as it acts on an individual who is a potential epileptic. Another interesting group of cases are those reported as exhibiting a variety of attacks, at times even said to be major, minor and psychic, which can in no wise be distinguished from those of epilepsy, but in which the attacks lessen or cease after the correction of some abnormal body condition as in intestinal intoxication. Since it is but seldom that an addition is made to our knowledge of the etiology of this disease, the matter of doing so seems deserving of more than passing notice. It now appears that tuberous sclerosis is the pathologic basis for a few cases of epilepsy.

For our first anatomic knowledge of tuberous sclerosis of the brain we are indebted to Bournville, and the appearance presented by the unhardened tissue is that of markedly indurated areas of sclerosis which are slightly elevated beyond the surrounding brain substance; in addition there are sometimes found small tumors protruding into the ventricles. Tuberous sclerosis in connection with glial formation may present the common picture of brain tumor.

Recently Schuster[1] has made the clinical diagnosis in some of the feeble-minded and epileptic. Eight cases were reported, one of which came to necropsy. The identity of the disease in these cases he bases on the finding of adenoma sebaceum on the face, together with small angiomas, the latter appearing chiefly at the sides of the nose and on the chin; other cutaneous anomalies may be present. At times the internal organs, especially the heart and kidneys, are invaded by small growths which may give rise to some of the symptoms found in the chronic disorders of these organs. The skin manifestations may to a less extent be met in some of the blood relatives. One man was seen who showed typical adenoma sebaceum without any other appearance of disease, but he had a daughter of 6 years who was an epileptic imbecile. Schuster states that tuberous sclerosis must be interpreted as a conditionally, endogenous, hereditary family disease. He furthermore refers to a relationship with Recklinghausen's disease and says that while tuberous sclerosis involves chiefly the brain and skin, in neurofibromatosis it is for the most part the peripheral nerves that are implicated.

More recently, however, Nieuwenhuijse,[2] in studying the question of a relationship between these two diseases, writes that their clinical appearance and also their anatomic changes are entirely different, that the skin fibromas which occur in both affections have their own individuality, and that when the brain is involved in Recklinghausen's disease, there is found a series of absolutely typical changes which are in no wise like those found in tuberous sclerosis.

Sailer[3] in 1898 recorded the finding of hypertrophic nodular gliosis in the brain of an epileptic idiot, and Munson[4] in 1912 reported his findings in an infant of 27 months who clinically showed only seizures and possible mental enfeeblement. At necropsy, he says, "Throughout the cerebrum are foci of hardening corresponding to single convolutions or to groups of convolutions. These are much harder than the intermediate cortex, and in places seem to be so hard as to be almost 'bony' to the touch." Munson, on anatomic grounds, placed the case with the true multiple scleroses. From the descriptions given by these writers I think it highly probable that both brains showed areas of tuberous sclerosis. I am not aware of any case that has been reported in English literature in which the clinical diagnosis of tuberous sclerosis has been made.

We have two patients at the Oakbourne Epileptic Colony which present the features described by Schuster in some of his cases. In neither of them has there been evidence of focal involvement of the brain. It is regretted that a complete family study has not been possible, but one patient is from a distance, both are of foreign-born parents who are very ignorant, and as a result our information in this respect is very fragmentary.

CASE 1.—The first patient is a girl of Italian descent, aged 14, whose attacks began at 7 years. She is one of six children, and the others, it is stated, are healthy. She was never robust and is said to have had rickets in infancy. Mentally, she is an epileptic imbecile and temperamentally she is morose and abnormally sensitive. The seizures are major in type, and three and one-half years ago she had status which lasted eleven days. Physically, her appearance is somewhat grotesque with a possible element of achondroplasia. There is also something suggestive of cretinism, and with this thought in mind we placed her on thyroid extract. For a time decided improvement was made and this was manifested in various ways, in six months she gained 15½ pounds in weight, there was an increase of 2 inches in height, she was less irritable and much more alert mentally, and while there were on an average of twenty-five seizures a month before the administration of thyroid, during this treatment for a period of six months she was free from attacks; unfortunately, she relapsed. This individual (Fig. 1) is small in stature, her legs are abnormally short and her hands reach almost to the knees; she is loose jointed, shows marked lordosis and has a protuberant abdomen; her features are thickened and the thyroid is not palpable. The pulse-rate is usually from 90 to 100 and the specific gravity of the urine is always low, sometimes not more than 1.002, but without albumin or casts. She is surprisingly tolerant of cold, never appearing uncomfortable even though thinly clad in the coldest weather.

The following very complete dermatologic report is by Dr. O. H. Foerster: On both cheeks, grouped above the nasolabial furrows, are numerous small pin-head to wheat-grain-sized papular tumors, discrete and confluent, firm, with convex summits, and of brown and yellow-red color. The larger growths are associated with well-marked telangiectases and on pressure are yellow-red in color. The remaining portions of both cheeks are clear, except for several similar isolated lesions of half-pin-head size. On the chin are about twenty similar discrete lesions of less than pin-head size.

Both alae nasi, and tip and dorsum of nose are practically covered by waxy or translucent, pink to yellowish, elevated, convex, closely set and confluent, papular growths of firm consistency. Several are associated with telangiectases, though less developed than on the cheeks. Similar, more rudimentary lesions of less than one-quarter pin-head size, and yellowish in color, are situated on the upper lip. In both nasolabial angles the lesions are more prominent and grouped, so as to give a verrucous appearance. On the left upper eyelid are several tiny lesions with color of normal skin.

On both sides of the forehead, extending toward the eyebrows from just within the hair-margin, are two elevated tumor masses of irregular outline, light yellow-red in color, with smooth flat surface except for several shallow clefts or furrows. The entire right temporal region down to a line between the outer edge of the right eyebrow and the right ear is occupied by a firm growth with irregular margins, of

1. Schuster: Deutsch. Ztschr. f. Nervenheilk., 1913, p. 96.
2. Nieuwenhuijse: Ztschr. f. d. ges. Neurol. u. Psych., orig., 1914, xxiv, 53.
3. Sailer: Jour. Nerv. and Ment. Dis., 1898, p. 403.
4. Munson: Jour. Nerv. and Ment. Dis., 1912, p. 251.

yellow-red color, lobulated on deep palpation, and of verrucose appearance. Embedded in the scalp at the right parietal region and at the occipital protuberance are two firm, ovoid, elevated masses of finger-nail size. On the neck are several small dark, pedunculated fibromas.

The middle third of the forehead is studded with comedones. The tongue, buccal and labial mucous membranes are normal. The lobes of both ears are abnormally large.

The extensor surface of the arms and dorsum of hands, from knuckles to above the elbow, is of light brown color, sprinkled plentifully with pin-head and slightly larger nonpigmented areas, with irregular, white patches of finger-nail size at the elbows and on the radial side of the right wrist. On the dorsum of the right wrist, on the radial and ulnar side, are two irregular, scar-like, slightly elevated lesions, with a "knitted" appearance, and spots of light-yellow to brown pigmentation. Palms and finger-nails are normal; hair-growth is normal.

Both legs are darkly pigmented, especially at the knees, and show several areas of entire loss of pigment, from finger-nail to small palm in size.

The skin of the back is of darker color than normal, with a moderate eruption of acne on the shoulders, upper back and in the sacral region. On the right shoulder is a group of three fibromatous yellow-red growths. Arranged irregularly in a belt-like manner just above the hips are several flat fibromas.

CASE 2.—The second patient is a girl of Slavish parentage, aged 15. It is said that her father has some curious markings on his face and that he has periodic headache and fainting-spells. A paternal uncle also has attacks of headache. At 3 years this girl was hit on the head by a ball and was unconscious for a time. Her attacks began at 4 years and her rank is that of an epileptic imbecile. For a time the seizures occurred daily but gradually they became less and less frequent and now she is for months without attacks. This individual presents several unusual features. Her voice is peculiar, sometimes it is feminine in pitch, at others masculine and again it will "break" as is common with the male voice at puberty. Though she had many major attacks previous to her admission to the colony, during her stay of two and one-half years with us, she has had only three complete epileptic seizures. Twice there have been vasomotor discharges in the form of intense redness which has covered all exposed parts of the body. Ten paroxysms of uncontrollable laughter have been recorded and three of these have occurred during sleep. There is a cartilaginous thickening of the left ear which has probably resulted from a hematoma auris. The palatal arch is high and narrow. This patient (Fig. 2) is markedly stoop-shouldered, she carries her head far forward and has a decidedly ungainly gait.

Dermatologic report by Dr. Foerster: In the flush area of the face, arranged with considerable symmetry, and grouped especially in the region of the nasolabial furrows and on the chin, are numerous pin-head and slightly larger tumors, many with telangiectases on their summits. They resemble in every particular the lesions described in Case 1, but are in general more rudimentary, though equally characteristic. Similar pigmented patches and flat nodular fibromas are present, though fewer in number and smaller. In addition there is a large flat nevus of the size of an adult's palm to the right of the lumbar spine.

SOME UNUSUAL ETIOLOGIC FACTORS

A remarkable cause of epilepsy is mentioned by Oppenheim[5] as having been observed by Marburg. It occurred in an individual after eating for many years from 1 to 1½ ounces of roasted coffee-beans a day. I have recently examined a patient in whom the exciting cause was most unusual. A man aged 20 of good heredity and correct habits had his first seizure immediately after a drive of several hours' exposure to a temperature of 20 degrees below zero. He now has attacks every month or two and is an undoubted epileptic. What change was brought about by this exposure we do not know, but perhaps it only aroused a slumbering epilepsy. The disease sometimes follows an electric shock, and Jolly[6] has recently recorded the instance of a motorman 20 years of age and previously healthy who on climbing to the top of his car came in contact with the charged pole; he was rendered unconscious. The next day he had pain in his head and fourteen days later there was an unconscious attack; after this there appeared complete epileptic seizures. It is admitted that the electric current may have been only the exciting cause. Spratling[7] speaks of a man of 32 years who had never had convulsions but who became an epileptic after receiving an electric shock. It is not stated that he was rendered unconscious by this shock.

In a patient recently seen there must have been some actual destruction of cerebral tissue. It was a patient of Dr. Henry Pleasant's, aged 26, and an electric worker; he came in contact with an alternating street current and was rendered unconscious. Later it was observed that he had a hemiparesis involving the right face, arm and leg. Following this was severe headache and at a time impossible to determine definitely, he began with minor attacks and three years after the shock he was having complete epileptic seizures.

Severe injuries from electricity usually cause death, and from the non-serious ones a good recovery may generally be expected. The changes most frequently observed in the brains of criminals who have been electrocuted are capillary hemorrhages, arterial anemia and venous congestion; more or less destruction of nerve-cells has been reported by one writer.

Gowers[8] speaks of the influence of light as exciting seizures in rare instances. He refers to two cases, one a girl who had just recovered from typhoid and whose first fit occurred immediately on going into the bright sunshine. At no other time did she have attacks. The other was a man whose attacks were always brought on by looking at a bright fire. Gowers states that the discharge apparently began in the visual center. A somewhat similar effect is seen in one of our cases. It is that of a young man whose face and neck muscles are thrown into most vigorous clonic contractions whenever a bright light falls on his eyes. At times the head is thrown backward violently and it may be held there as much as thirty seconds. Rarely, these clonic movements pass into complete epileptic seizures, but nearly all of his major attacks appear precipitately. Very rarely there is spontaneous recovery from epilepsy. The following case is one in which all motor manifestations ceased but a paraplegia persisted: A boy at 2 years developed fever, was nauseated, had general convulsions and then the right arm and leg became helpless. He probably had an attack of acute poliencephalitis. The right arm and leg remained spastic, and jacksonian convulsions were manifested from time to time until 13 years, when the attacks ceased spontaneously. They stopped, strange to say, at an age when epilepsy is very prone to begin. He has now been for eleven years without attacks.

The next case is one in which jacksonian convulsions developed into or at least were masked by com-

5. Oppenheim: Lehrbuch Nervenkrankheiten, 1913, p. 1590.

6. Jolly: München. med. Wchnschr., 1912, p. 1453.
7. Spratling: Epilepsy and Its Treatment, 1904, p. 124.
8. Gowers: Epilepsy and Other Chronic Convulsive Disorders, 1885, p. 75.

plete epileptic seizures. The patient is rather remarkable because of the great variety of nervous phenomena displayed. This girl probably also had an attack of acute poliencephalitis at 2 years. In the month of May she had fever and convulsions and lay unconscious for a week. On regaining consciousness it was observed that there was disability of the right face, arm and leg. For three weeks the child seemed aphasic; at first she did not talk at all but soon learned again. From time to time slight motor disturbance occurred on the right side and at 10 years the child was placed in a home for crippled children. When she began to use her pen, which she held in her left hand, she wrote mirror-writing; it was with difficulty that the child learned to write correctly. By this time there were pronounced jacksonian seizures and at 14 years attacks developed in which the convulsions were general and the unconsciousness absolute. The patient's acute illness in infancy was followed by aphasia, right hemiplegia, jacksonian convulsions which developed into complete epilepsy, and she also exhibited athetosis, associated movements and mirror-writing.

Another patient is an epileptic girl with myoclonus and recurring sighing manifestations. Her age is 13 and the attacks began at 3 years without obvious cause. The seizures are both major and minor. There is often observed a distinct bodily movement in an arm, a leg or the head and sometimes the shoulders are shrugged. In addition there are less-marked contractions of the muscles in the face and in other parts of the body. All of these movements may be observed during sleep. The patient often sighs deeply both when asleep and when awake. There are at times diaphragmatic spasms. The myoclonus is always more marked after seizures. There are likewise lesser movements that may be felt but not seen. At all times by grasping an arm or leg, a distinct muscular contraction may be felt within the part and the feeling transmitted is that of throbbing or pulsation.

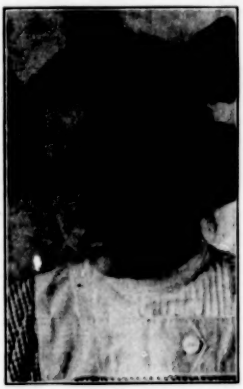

Fig. 1.—Epileptic imbecile showing sebaceum, angiomas and tumor masses.

Fig. 2.—Epileptic imbecile showing the same condition as in Figure 1, though more rudimentary.

SLEEP AND EPILEPSY

The relation between sleep and epilepsy is most curious and interesting. Most epileptics after a complete attack have a temporary awakening and from this they usually drop into deep sleep. Rarely, this sleep is absent as shown in the following case: A girl aged 18 had her first attack two days after the burial of her mother. She is now 33 years old and has many short but severe attacks. She injured herself so often and so badly that for a long time a protector was worn on her head. The seizures are both nocturnal and diurnal, but now for some months all attacks have been confined to the periods of sleep. This patient has never slept after an attack and even though the seizure occurs during the deepest sleep, she invariably awakens at once and remains awake from a half to two or three hours.

In some individuals sleep is the only known cause of recurring attacks. It is said that in most epileptics the seizures have begun during sleep, that often it is in the deepest sleep that a paroxysm occurs and that more attacks take place when asleep than when awake. There are momentary losses or absences which have the appearance of sleep, but they are something more than this, for attacks of some kind are frequently seen while these individuals are actually asleep. Besides, if stuck sharply with a pin while in such attacks, unconsciousness as a rule is uninfluenced; any other person at such a time would awaken at once. Such seizures resemble more nearly the disturbance of consciousness seen in cardiac syncope. In connection with this subject, I have observed a very curious case. It was a girl of 19 years whose attacks began at 10 years without known cause. She has major and minor epilepsy with seizures occurring eight or ten times a day. She also has hallucinations of sight and these usually appear just before her attacks. This patient is very drowsy and if permitted, would sleep as much as fifteen hours out of twenty-four. She always takes several naps during the day and will even fall asleep while scrubbing the floor. At one period of about a month's duration, she appeared to be passing into sleep incessantly; all day long she would begin to doze and then promptly recover herself; and this happened several hundred times a day for several days. Considering her drowsy condition, it is difficult to know where to place this phenomenon. Was the manifestation psychic attacks of epilepsy, was it narcolepsy or was this individual an epileptic exhibiting attacks of narcolepsy?

SO-CALLED NON-EPILEPTIC "ABSENCES"

Friedmann[9] asserted that certain cases previously classified as showing petit mal were really instances of non-epileptic "absences," and furthermore stated that such seizures probably had no relation to hysteria. He described fifteen personally observed cases and regarded the seizures as narcoleptic in nature. This subject has recently been referred to in this country by Sedgwick.[10] In this connection Gowers[11] states that "before fifteen cases of narcolepsy were met, 30,000

9. Friedmann: Deutsch. Ztschr. f. Nervenheilk., 1906, p. 462.
10. Sedgwick, J. P.: Spasmophilia with Especial Reference to Familial Reactions and Repeated Absences, Am. Jour. Dis. Child., February, 1914, p. 140.
11. Gowers: Borderland of Epilepsy, 1907, p. 116.

cases of epilepsy would come under observation! Most of these cases were probably minor epilepsy." The features of this disorder are, according to Friedmann, attacks which usually begin between the ages of 4 and 7 years in apparently healthy children; they consist of a momentary disturbance of consciousness and almost without convulsions or falling; they recur from six to ten and up to 100 times a day; it is only occasionally that they appear at night and frequently they are recovered from; the physical and mental development of the child is not affected.

I have studied two such cases. The first is a girl aged 14 whose attacks began at 9 years without obvious cause. The seizures vary in number from six to thirty per day and are of from ten to fifteen seconds' duration. This momentary disturbance of consciousness is not preceded by an aura; never has there been a convulsion. This girl is healthy, growing rapidly, unusually active and has the mentality of a normal child. So far she conforms to the description of Friedmann's cases. But on further careful study, many attacks are seen while she is asleep; she was once known to fall and in a number of attacks has wet her clothes. If sitting and caught at the time of a seizure her arms and legs are found to be slightly rigid; but if walking she continues though sometimes with slight wavering; occasionally, the movements of tasting are seen. After some of the seizures there is an action suggestive of straightening out the clothes, and this we know is common among epileptics.

The second patient is a girl of 16 years whose so-called "absences" began at 6 years without obvious cause. The attacks usually vary from six to ten per day but they have gone as high as 100. The usual duration is from fifteen to twenty seconds. There is no aura and while she is generally unconscious, some seizures are so light that they are barely apparent even while one is watching her. She also is healthy, is growing rapidly and is of average mentality though somewhat peculiar. During the nine and one-half years of the disease there have been two convulsive attacks with complete loss of consciousness. If spoken to while in a spell there is no response; if stuck sharply with a pin at the beginning of an attack, the seizure is aborted; but if fairly under way the hand is drawn from the irritation although she has no subsequent knowledge of having been stuck. There is an occasional drowsy episode during which time the patient can hardly be kept awake. Since the age of 14 a very interesting feature of her clinical history is recurring attacks of complete migraine; these usually appear three or four times a month. The intelligence of this girl has made her description of the attacks interesting. The migraine is preceded by the appearance of a bright light before one or the other eye but never before both in the same attack. This light is shaped like the flame of a gas-jet with a serrated upper edge and an attenuated extremity which always points to the outer side and which the patient speaks of as the "tail." The light lasts about twenty minutes and before it disappears headache begins; this is always preceded for about a minute by double vision. The headache usually persists for a half hour and frequently there is nausea and vomiting. When the attack subsides she feels perfectly well except for extreme weakness.

I believe the "absences" in these two cases are best classified as momentary psychic attacks of epilepsy. It may be that Friedmann and others have regarded the motor manifestation as the cardinal symptom in epilepsy, whereas the disturbance of consciousness is now generally accorded first place.

It is obvious that a great variety of momentary phenomena important in the matter of diagnosis may be lost unless the patients are constantly under the care of trained and observant attendants.

To me, the conclusion that these two patients are epileptics is inevitable.

The last patient has associated with her epilepsy attacks of migraine. As to the relation of these a wide difference of opinion exists; but some light should be thrown on this question by a careful study of the cases in which there is a clinical history of both affections.

2005 Chestnut Street.

ABSTRACT OF DISCUSSION

DR. ALFRED GORDON, Philadelphia: Were roentgenograms taken of the skulls? Roentgenograms may reveal changes in the skull similar to those on the skin.

DR. WILLIAM G. SPILLER, Philadelphia: I am glad Dr. Yawger has reported on this subject, because, as he has said, there is nothing in the English literature with regard to it. Those who are familiar with Schuster's report will recognize that the two cases presented by Dr. Yawger are exceedingly like those of Schuster. If we can establish the existence of tuberous sclerosis by the means Dr. Yawger has mentioned and make a diagnosis in epileptic cases, we have made a distinct advance.

DR. N. S. YAWGER, Philadelphia: Replying to Dr. Gordon's question, I would say that we have not made any Roentgen-ray studies in our cases.

A NEW METHOD OF TREATMENT OF LUPUS VULGARIS*

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CINCINNATI

In 1911 I[1] published a short monograph covering a brief clinical experience with trichloracetic acid in concentrated form. Reference was made to the fact that this time-honored and more or less generally employed nose and throat remedy had received little favorable notice as a therapeutic agent in dermatology.

Lanz,[2] in an article on the topical application of 20 per cent. trichloracetic acid by means of an endoscope in chronic urethritis, incidentally refers to the success attending its use in papillomas, warts and pigmentations.

In the monograph above referred to, I set forth the success which attended the treatment of moles and circumscribed pigmentations, vascular nevi and telangiectases and warts and papillomas, with a saturated solution of trichloracetic acid, and incidentally mentioned that immediate favorable results were also noted in lupus vulgaris and several other affections. I have continued to use this remedy with unfailing benefit in all cases of lupus vulgaris and tuberculosis verrucosis cutis which have come to my notice within the past three or four years, many of which have proceeded to complete clinical recovery. These cases form the basis for the presentation of this paper.

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Heidingsfeld, M. L.: Arch. d. Dermat., 1911, cx, 245.
2. Lanz: Monatsh. f. prakt. Dermat., 1891, xiii, 274.

In spite of the innovation of many new and successful features in recent years, in lupus therapy, no single remedy or well-defined plan of treatment of lupus vulgaris has thus far found general or universal favor. Authors and investigators have exploited their particular views from time to time, expressing their

Fig. 1 (Case 1).—Patch of lupus on left cheek, of forty-two years' duration.

predilection for this or that special form of treatment, but always with a considerable degree of reservation, in reference to the completeness of immediate results and absence of relapses. This conservatism has resulted in the conservation of all the generally accepted old and new methods of successful treatment in the monographs of nearly all who have written on the subject in a text-book or general way.

Of noteworthy interest in this direction is the fact that a commission appointed by the German government in recent years, for the purpose of studying the cause, prevention and cure of lupus, set forth in a report[1] in May, 1910, that all hitherto accepted methods of successful treatment such as the application of astringent, stimulating and erosive pastes and ointments, the use of the Roentgen ray, Finsen and Kromayer light, radium and mesothorium, the various forms of surgical procedure after the method of Lang and others, should, at least for the time being, be retained. The same commission in an earlier report, in November, 1908, stated that there were 11,354 recorded cases in Germany at that time, and estimated the total number for the empire, after making due allowance for the unrecognized, undiagnosed and non-reported cases, to approximate 33,000 cases.

The treatment therefore laid down for lupus vulgaris, like all things in medicine without a specific and unfailing medication, embraced a sea of remedies and methods in which the patient and physician are often hopelessly engulfed. It includes, on the one hand, all forms of palliative and mildly stimulating remedies such as diachylon, oleate of mercury, salicylic acid, resorcin, ichthyol lotions and ointments, etc.; on the other, such caustic erosive and destructive agents as lactic, sulphurous, nitric, pyrogallic and arsenous acids, Vienna paste, acid nitrate of mercury, silver nitrate, caustic potash, etc. In addition to these and numerous other agents, tuberculin, the application of Roentgen rays, radium, Finsen and Kromayer light, Hollander superheated air, Paquelin and galvanocautery, carbon dioxid snow, curettement, linear scarification and radical extirpation, and various other procedures have been, and continue to be, exploited from time to time. Each and all have received at one time or another a generous degree of recognition, and are to this day more or less universally used with at least a very fair degree of success. Without question, many of these old and time-honored measures are not without virtue, but if any of these, new as well as old, possessed overshadowing and unfailing properties, the vast majority would long ere this have been relegated to the discard. Time will not permit me to enter into a detailed consideration of their respective merits or relative worth.

It is possible that I am adding another remedy, or at least another method of its application, to the already too long list of "tried and found wanting," but several years of patient study and observation have led to the conviction that it is not only far superior

Fig. 2 (Case 1).—After treatment.

to any method of lupus treatment which has thus far come to me in my personal experience, but apparently quite the equal, if not superior in results, to those which I personally observed in Copenhagen, Stuttgart, Vienna, Paris and elsewhere. Unless I err in judgment, the results which I have thus far attained compare most favorably with those which I have

1. Nietner: Strahlen Therapie, 1913, ii, No. 1.

observed from other generally accepted successful methods, embracing in a measure their special advantages, and circumventing many of their objectionable features.

For example, the cosmetic result is invariably excellent and as perfect as the physical conditions at the time treatment is instituted can reasonably justify.

Fig. 3 (Case 2).—Patch of lupus on left cheek of six years' duration, before treatment.

The cosmetic results compare most favorably with those observed at the Finsen Institute at Copenhagen and those of the quartz-mercury lamp, both generally conceded to be of the highest order. They are better than those generally obtained from the Roentgen ray, radium, mesothorium and thorium X, particularly when the application of these agents is followed by atrophic scars. The patients are also spared the unpleasant and at times persistent and very painful dermatitis which these agents call forth. The cosmetic results are superior to the good results which I have observed at the hands of Veiel of Stuttgart, a master in the successful use of pyrogallic acid paste; the method is devoid of the pain, discomfort and disagreeable features of the pyrogallic acid method of treatment. The cosmetic results are far superior to those obtained from the use of caustic and destructive and erosive substances, scarification, curettement and excision, after Lang's, Payer's and other methods.

The treatment is far superior to most of the enumerated methods, in that it entails no cost in equipment and can be readily adapted to meet all the exigencies of every form of practice. The results assert themselves with surprising promptness; improvement is almost invariably noted within a few weeks, and a cure in the more moderate cases is effected within six months or a year. This compares favorably with all other methods, with the exception of a radical operation, and is second only to radium and its allied radio-active substances.

The pain and discomfort is of momentary and transient character, a sense of slight burning and stinging, readily tolerated by children as well as adults. Successfully treated patches of lupus which are smooth, devoid of scales and roughness, and show no congestion or nodules under glass-slide pressure, remain, as well as the still somewhat limited period (two years) permits judgment, permanently well and show less tendency to relapse than I have observed from light and radium treatment. Particularly noteworthy is the fact that the actively spreading and usually very persistent borders respond with almost as much promptness as the partially cicatrized centers. Relapsing nodules in partially or neglected treated patches respond with every degree of promptness when treatment is reapplied.

METHOD OF TREATMENT

A saturated solution of trichloracetic acid is obtained by adding 10 drops of distilled water to an ounce of pure crystals. A tiny pledget of cotton is carefully wrapped around the end of a small rounded wooden toothpick, by means of which the remedy is applied as far as practicable, to each congested nodule. The remedy apparently exerts a selective action, attacking the nodules with greater promptness and sparing somewhat the intervening more normal or

Fig 4 (Case 2).—After treatment.

cicatrized areas. This selective action is also noted if the remedy is applied more or less diffusely to a generally congested surface, although better results are usually obtained if it is carefully applied to the individual nodules for a few seconds at a time. The application produces a momentary sense of discomfort and stinging, which can be promptly allayed by the application of the following:

Sulphurated potassa	
Zinc sulphate, of each	1 part
Zinc oxid	10 parts
Lime-water	15 parts
Distilled water, enough to make	40 parts

Powdered carmin, enough to color pink.

This application serves, in addition to its protective and healing properties, as a cosmetic to hide the glaring whiteness produced for the time being by the trichloracetic acid. The trichloracetic acid should be applied to areas not much larger than a silver quarter, at a time, and repeated at seven- to fourteen-day intervals. Under the treatment the nodules become the seat of superficial crusts which exfoliate within from five to ten days. The general congestion diminishes, and the nodules lose in intensity of redness, and rapidly diminish in size, until they gradually become no larger than pin-heads and ultimately disappear. Mucous membrane lesions on the lips and within the nose have yielded with equal promptness and success.

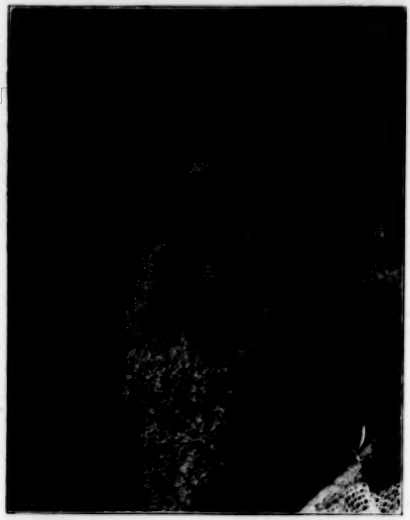

Fig. 5 (Case 3).—Partially cured by treatment.

CASE REPORTS

CASE 1.—C. L., shoe manufacturer, aged 44, large circular patch of lupus covering almost entire left cheek, present from early childhood and slowly extending until nose and lips were encroached on. Unsuccessfully treated a number of times by means of pastes, curettement, Roentgen ray and light. Surgical extirpation was at one time recommended. Patient no longer entertained any hope of relief and for the past few years merely employed cosmetics to hide the physical disfigurement. Treatment was instituted Oct. 4, 1913. Thirty-two applications have been made and patient pronounced clinically well, May, 1914.

CASE 2.—B. S., aged 16, Roumanian, patch of lupus size of a twenty-five cent piece, on left cheek, near nose; duration six years. Trichloracetic acid treatment instituted April 20, 1913. Improvement noted within two weeks. The remedy was applied, all told, fourteen times and patient was discharged well, Oct. 4, 1913. No relapses at present writing.

CASE 3.—Mrs. R. A., aged 35. Triangular patch of lupus on left cheek anterior to right ear, 1½ by 1½ by 1¼ inches, of twenty years' duration. Varied attention from various physicians, unsuccessful. Trichloracetic acid first applied Jan. 4, 1913, and patient discharged well, April 9, 1914.

CASE 4.—Mrs. A. E. H., widow, aged 52, lupus vulgaris twelve years' duration, involving nose, right cheek and right eyelid. Treatment instituted April 16, 1914. Material improvement noted June 10, 1914.

CASE 5.—E. J., aged 23, lupus vulgaris present from early childhood. Large patch covering the larger portion of the left cheek, extending from the anterior border of the left ear, almost to the left eye and nose, involving the lips and left side of mouth, and extending over the neck from the chin to the angle of the jaw. Tuberculin, Roentgen ray, Kromayer quartz-mercury lamp, pyrogallic acid, caustic and stimulating pastes were all used to no avail. The Roentgen ray effected some temporary improvement but also a very serious degree of severe atrophic disfigurement. The Roentgen ray was unable to check recurrences. Trichloracetic acid was first applied, April 21, 1911, and the case was brought under excellent clinical control, although not radically cured, owing largely to apathy on part of the patient, in March, 1912. The mucous membrane lesions yielded with surprising promptness. A few recurrences have manifested themselves from time to time, particularly in the parchment-like Roentgen-ray atrophies. On date of last visit, April 17, 1914, patient's condition was under favorable control.

CASE 6.—J. C. D., aged 32, organist, lupus of left foot of ten years' duration, which resulted in entire destruction of large toe and necrosis of distal phalanx of second toe. Vocation seriously threatened and for the time being, impaired.

Fig. 6 (Case 3).—Treatment discontinued.

Trichloracetic acid first applied Oct. 29, 1913. Greatly improved and vocation resumed, November 24. Case greatly improved but still under observation at present writing.

CASE 7.—Mrs. G. E., aged 41, wife of physician, small patch of lupus vulgaris, size of a silver dime, on left side of chin. Duration several years, following electrolytic removal of a mole. Trichloracetic acid was first applied, Jan. 3, 1912, and the patch was promptly brought under clinical control. There have been no signs of recurrence for almost two years and

patient appeared radically and permanently cured on date of last visit, June 2, 1914.

Case 8.—Mrs. S. H. G., aged 53, lupus vulgaris infection followed slight laceration to right ear ten years ago, from an earring. The nodules slowly extended themselves downward over the lobe of the ear and over the right cheek, to the angle of the jaw and upwardly over the free edge of the ear to its upper third. Caustic and erosive pastes and liquids, curettement, Roentgen ray, tuberculin, light, etc., were all used without success. Trichloracetic acid was first applied, April 21, 1911, and a clinical result was apparently attained, May 29, 1912. The cheek remained permanently well, but a few nodules again made their appearance over the free edge of the ear, March 7, 1913, but promptly responded to a few additional applications of the remedy.

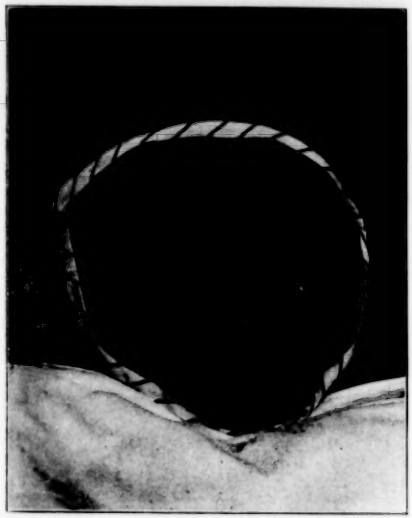

Fig. 7.—Photograph of moulage of Case 4 before treatment.

Case 9.—Mrs. M. T., aged 56, lupus vulgaris of thirty-three years' duration, which has destroyed almost the entire cartilaginous portion of the right ear, and has extended posteriorly into the scalp, and downward over the right cheek to the angle of the jaw, forward to its middle third, and upward to the outer canthus of the right eye. A few outlying nodules are situated on the right side of the forehead, and near the right angle of the mouth. Curettement, caustic and erosive preparations, Roentgen ray and light have been unsuccessfully applied. Trichloracetic acid was first applied, Jan. 22, 1914, and the patient at present writing is apparently progressing toward prompt and satisfactory recovery.

Case 10.—J. B., aged 53, painter, circumscribed patch of lupus verrucosus cutis on lower third of left tibia, size of 1 by ¼ by ⅛ inches in the various diameters, of eighteen years' duration. Enlargement has been very slow and insidious. Trichloracetic acid first applied Jan. 16, 1914; discharged well, April 15, 1914. No evidence of relapse, May 13, date of patient's last visit.

Case 11.—W. G., aged 20, baker, several small, warty, painful excrescences over the dorsal aspect of the left hand, near the knuckle of the index-finger, with a history of about one year's duration. Clinical diagnosis of tuberculosis verrucosa cutis, was, in a measure, confirmed by physical signs of pulmonary apical involvement and bacilli in sputum. Trichloracetic acid was first applied January 15, and followed by applications, January 29, February 12 and 26, and patient was discharged well, July 15, 1913. No relapses at present writing.

Case 12.—A. J. C., aged 39, with numerous painful fissured excrescences of tuberculosis verrucosa cutis, covering the dorsal aspect of both hands, of approximately eighteen months' duration. Diagnosis clinically confirmed by well-advanced pulmonary tuberculosis and sputum laden with bacilli. Remedy first applied, March 6, 1914, and, April 8, date of patient's last visit, clinical recovery seemed already established.

19 West Seventh Street.

ABSTRACT OF DISCUSSION

Dr. William T. Corlett, Cleveland: I have had no experience with this special drug in the treatment of lupus vulgaris, although deep curetting, followed by the application of phenol or the acid nitrate of mercury has given me the best results. I have gradually come to regard lupus vulgaris as one of the most obstinate affections with which we have to deal, and I do not greatly regret when such patients, who expect rapid and brilliant results, go elsewhere — to the surgeon, for instance, where radical treatment by the knife is usually resorted to. With the Roentgen ray I have had some favorable results, but as a routine treatment I have not found it successful.

Dr. M. L. Ravitch, Louisville: I have found lupus vulgaris analogous to psoriasis, "on again; gone again." Whether we use the monochloracetic acid or the trichloracetic acid, this agent is very destructive in its effects. About three years ago Dr. D. W. Montgomery, San Francisco, referred to Dr. Heidingsfeld's use of this remedy, and reported favorable results from it in the treatment of keratotic conditions. I have had little success with the remedy in this condition. In lupus vulgaris we do not know whether we are dealing with a localized condition or a manifestation of general tuberculosis. I have found phenol (carbolic acid) and iodin very satisfactory in a number of cases of lupus vulgaris, the acid being first applied and then painted over with iodin. Persistently applied, this remedy acts admirably.

Fig. 8 (Case 4).—After partial treatment.

DR. HENRY C. BAUM, Syracuse: I have used trichloracetic acid in a variety of conditions for many years, and while my results in some instances were very satisfactory, they were not equal to those of Dr. Heidingsfeld in cases of lupus vulgaris, which is perhaps due to the fact that I did not continue the treatment as persistently as he did. My experience with the Roentgen ray does not agree with Dr. Corlett's. I have treated many cases of lupus vulgaris with the Roentgen ray with perfectly satisfactory results, both from a cosmetic point of view and as to permanency of the cure. I can recall only one case in which the outcome was not satisfactory, and in that instance I had excellent results from pyrogallic acid, which I find has a selective action in lupus, selecting and destroying the diseased areas very beautifully. We should not lose sight of the fact that lupus is not a superficial disease: with the microscope we find cells deep down in the corium. It is hopeless to try to eradicate the disease by superficial treatment, and it is because the Roentgen ray penetrates deeply that it is so valuable.

DR. WILLIAM S. GOTTHEIL, New York: The man who calls attention to an old remedy is entitled to just as much credit as he who suggests a new one. Under Dr. George H. Fox I have seen lupus vulgaris treated with phenol and various acids, trichloracetic and nitric, the applications being made with a toothpick inserted deep into the lesions. I was surprised to hear from Dr. Baum that he has had such good results in lupus vulgaris with the Roentgen ray. In New York City the Roentgen ray has been practically discarded by the radiologist as a therapeutic agent.

DR. S. E. SWEITZER, Minneapolis: Has this treatment been of value in lupus of the mucous membranes? In our part of the country, lupus vulgaris appears to be very rare. In a case which I saw recently, the disease involved the outside of the nose and also the nasal mucous membrane.

DR. H. H. HAZEN, Washington, D. C.: To my mind, lupus vulgaris, as I see it in hospital practice, is comparable to rodent ulcer, and I believe the correct method of treatment, in early cases, is to get rid of it surgically. Under local anesthesia the lesion should be thoroughly curetted and then treated with the actual cautery. In some cases I have used the acid nitrate of mercury, after the manner described by Dr. Samuel Sherwell. I have very little faith in the so-called selective action of various applications, inasmuch as they would not destroy isolated foci of infection, and my experience with the Roentgen ray has led me to believe that in over one-half of the cases of lupus vulgaris in which it has been employed, there is a relapse sooner or later, usually within one or two years.

DR. J. B. SHELMIRE, Dallas: I have not seen a case of lupus vulgaris in my part of the country for the past eighteen years, or, at least, I have not recognized any as such. Of two cases that were sent to me with that diagnosis, one proved to be syphilis and the other cancer.

DR. JAY F. SCHAMBERG, Philadelphia: In view of the derogatory remarks made by one of the speakers concerning the value of the Roentgen ray, permit me to state that some years ago I saw a very extensive case of lupus vulgaris involving a large part of the face which was cured by the use of the rays; the cosmetic result was excellent, and there has been no recurrence for seven years.

DR. M. B. HARTZELL, Philadelphia: I think the good results obtained by Dr. Heidingsfeld in the cases he has reported are largely due to his persistency. Whether we use trichloracetic acid or any of the other destructive agents, we must be persistent. My experience with this remedy dates back some fifteen years when I used it on a boy whose mother always had to help us in holding him down while we made the applications, which I recollect were extremely painful.

DR. J. B. KESSLER, Iowa City, Iowa: I have used trichloracetic acid in keratotic conditions, but have had no experience with it in lupus vulgaris, which is very rare in my section of the country; I have probably not seen more than one or two cases in the past dozen years. I cannot agree with Dr. Heidingsfeld that the application of trichloracetic acid is comparatively painless. I have resorted to it in various cutaneous conditions and most of my patients complained considerably about it.

DR. M. L. HEIDINGSFELD, Cincinnati: While trichloracetic acid is an old-time remedy, I have searched the literature very carefully and have failed to find any except slight reference to its use in lupus vulgaris. It has been most extensively employed in throat and nose work, in 20 or 30 per cent. solutions. In my work I have used it in concentrated form, and

Fig. 9 (Case 8).—After treatment.

while the applications have been attended by some pain and discomfort, these have not been excessive and I have heard very little complaint from either children or adults. It is possible that this is due to the application I make after the treatment, as described in my paper. Pyrogallol, to which Dr. Baum referred, has proved very disagreeable and unsatisfactory in my hands. Surgical treatment, while sometimes imperative, is objectionable to many patients on account of the resulting disfigurement. In response to Dr. Sweitzer's query, my results with mucous-membrane lesions in close proximity to the skin of the lips and nose have been equally gratifying in character.

Mathematics and Digestion.—The researches of Pawlow and his pupils have clearly demonstrated the obedience of the digestive processes to mathematical laws. Thus, it has been ascertained that the time of digestion is, roughly speaking, proportional to the square root of the quantity of food, and that the same is true of the amount of gastric juice secreted in a given time. Professor Svante Arrhenius, in his recent lecture at the Royal Institution on "The Identity of Laws in General and Biological Chemistry," pointed out that, just as in reactions in general chemistry, the velocity of the reaction increased with the temperature, so also is this the case with organic products and vital processes, the action of enzymes being accelerated by increase of temperature up to certain limits. It might be helpful to diners-out if a digestive time-table of the various articles of food were appended to the menus, or, better still, indicated in special type after each dish. Such a "psychological restaurant" might pay well if established within easy distance of Harley Street.—*Med. Press*, June, 1914.

GENERALIZED NEUROFIBROMATOSIS (Von RECKLINGHAUSEN'S DISEASE)

REPORT OF A CASE SHOWING A SUPERFICIAL RESEMBLANCE TO HODGKIN'S DISEASE

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Generalized neurofibromatosis, von Recklinghausen's disease, is by no means a rare condition, occurring in the proportion of about 1:1,300 dermatologic cases[1] (85 in 112,775). Were one to take into account the *formes frustes* of Thibièrge[2]—cases exhibiting only generalized pigment spots, and a functional, psychic or trophic disturbance, but no cutaneous or nerve-tumors — the percentage would then be considerably higher.

As the etiology and pathogenesis of the condition are by no means *res edjudicatae*, each case not fully conforming to the recognized types merits recording, both for satistical purposes and with a view of throwing new light on some of the obscure features.

Fig. 1. — Photograph showing lymphatic appearance, cervical swelling, diffuse pigment spots and nevi. Note the absence of elevated skin tumors.

Fig. 2. — Photograph showing particularly pigment spots and fulness of cervical region.

From time to time, extensive monographs on the subject have appeared. The first, that of von Recklinghausen[3] (1882), collects the authentic cases recorded up to that year and establishes the condition on a firm clinical and pathologic basis; from his work, the morbid process has derived its name. Alexis Thomson,[4] in a monograph appearing in 1900, gave the subject exhaustive treatment. Adrian[5] (1903), on the basis of 447 cases which he was able to gather from the literature, published a comprehensive review of all features of the process, essential and occasional. So complete is his *Sammel-Referate*, that a survey of the literature of the last decade—comprising several hundred cases, the majority from French sources—enables one to add little that is vital to the knowledge of the subject.[6]

The particular interest attaching to the case we wish to record is its superficial resemblance to morbus hodgkinii. At the conclusion of our report, on the basis of our observations and of manifestations recorded in the literature, we desire to emphasize certain items relative to the etiology and pathologic place of the entity.

History.—Master John D., aged 16, a schoolboy, entered Wesley Hospital, April 28, 1914. As was facetiously remarked at the time, he arrived with a written diagnosis in one hand and a vial of vaccine in the other. It would seem that a short time previous to admission he had been under observation at the experimental station of a well-known pharmaceutical house, where he was placed on vaccine treatment for Hodgkin's disease. The diagnosis was made after removal of a subcutaneous node from the right deltoid region; from this tumor, we presume, was cultivated the organism used in the making of the vaccine. As no improvement followed the injections, the boy was referred by Dr. Hayman for observation.

Up to the onset of his present illness, the boy had always been well, except for an attack of measles, two years before. This had affected his eyes and had necessitated his remaining out of school a year.

The family history is irrelevant; there has been no similar illness among his relatives, according to the statement of the boy's mother. There is no history of tuberculosis.[7]

The present complaint began five to six years ago when there were first noticed some "lumps" in both cervical regions, though attaining a greater size in the left. These tumors were sensitive to pressure and gradually grew larger, the mass on the left side reaching half the size of his fist. After the lapse of six months, the tumors became smaller and less sensitive. (Particular questioning elicited the fact that when a baby he had "rheumatism," at which time his feet were very tender and he could not walk.)

Soon after the appearance of the cervical masses, the boy noticed tender areas in both arms, which were sensitive following slight bruises; even moving the arms in certain directions caused pain. Somewhat later, small tumors could be felt under the skin of the arms. Subsequently similar tender lumps appeared on the trunk, scalp and lower extremities.

In March of this year the patient discovered innumerable small nodules when passing his hand over the integument, particularly of the arms. In the past year, occipital headache, of frequent occurrence, associated with dizziness has been present.

Present Status (April 4, 1914).—The boy is a well-nourished, healthy appearing lad of 16, weighing 102 pounds (Figs. 1 and 2). Physically and mentally he seems to represent his years. Aside from nostalgia and worry over the failure of therapy in his case, he feels very well. His appetite is good, he sleeps well, and his bowels are regular. He cannot play, however, as do his friends, because of pain in the groins and popliteal spaces when he romps about. Sudden or extreme movements of the arms also cause pain.

He presents to a certain degree that typical, but difficult to describe, lymphatic facial appearance—a slight puffiness of the lids and skin of the face—which the Germans so happily express as *pastös*. The teeth are in good condition except for the right lower molar (roentgenogram by Dr. Hollis E. Potter shows no periapical abscess). The gums are spongy and bleed easily; on pressure, pus exudes from the incisors of the lower jaw. The soft palate shows an irregular lymphatic thickening; the tonsils are medium-sized and not distinctly abnormal.

The right ear has been numb, following the recent (January, 1914) removal (elsewhere) of three small tumors from the right side of the neck. The paresthesia extends also to

1. Heidingsfeld: Am. Jour. Dermat., July, 1900.
2. Thibièrge: Société médicale des hôpitaux de Paris, Feb. 18, 1898; quoted by Lion and Gasne: Bull. et mém. Soc. méd. d. hôp. de Paris, 1904, xxi, 5.
3. Von Recklinghausen: Ueber die multiplen Fibrome der Haut, etc., Berlin, 1882, (literature).
4. Thomson, Alexis: Neurofibroma and Neurofibromatosis, Edinburgh, 1900.
5. Adrian: Centralbl. f. d. Grenzgeb. d. Med. u. Chir., 1903, vi, (literature).
6. Kerr: Surg., Gynec. and Obst., January, 1914 (extensive bibliography compiled by Dr. von Klein of the Crerar Library).
7. Wittemann: Med. Klin., 1911, vii, 882.

the right side of the face, neck and shoulders. For a time, the patient could not rest on his side because it felt "board-like." Another tumor, removed at the same time, from the left cubital region—which was freely movable from side to side, but not from above downward—caused no sensory disturbances. In March of this year, a "lump" was taken from the right shoulder region; from this the diagnosis of Hodgkin's disease was made and the vaccine prepared (!) following which there remained a numbness over the anterior aspect of the right arm.

The most striking feature, from the first glance at the boy, is not the existence of the numerous tumors, but the presence of innumerable diffuse pigment spots of various kinds. The majority of these are freckle-like and distributed chiefly over the trunk; in addition there are seen nevi—in particular, one large one on the anterior abdominal wall—pea-sized bluish areas surmounting small nodules in the skin, and a patch of atypical hair, reddish in hue, the size of the palm of the hand on the left forearm.

The cutaneous and subcutaneous nodes are distributed over the entire body, and vary in size from that of a pinhead to that of a walnut. The largest are in the left cervical region. In the lower cervical region they are massed together like bunches of grapes composed apparently of many hundred tumors on either side. Many of the nodules are associated with a thick firm strand, in most cases coursing centralward from the tumor, in a few peripherally.

An attempt to count the tumors, as a number of writers have painstakingly done, was not made; but it can safely be asserted that they run into the hundreds. No portion of the integument is free from them; a delicate palpation often would reveal a millet-sized node where none was suspected. The large number in the cervical, antecubital, anterior crural and popliteal regions explains the complaint of the boy that moving the arms and legs is painful.

A notable feature of this case is the absence of large skin tumors. The great majority of illustrations accompanying the presentation of these cases show numerous large, sessile, wart-like growths of the skin; in this patient, however, a cursory glance would scarcely reveal an elevated node. Many of the cutaneous lumps are covered with a bluish and bluish-red skin. None gives spontaneous pain, but nearly all are tender to pressure.

As to the remainder of the examination, a few words will suffice. Nodes can be palpated at all the various points where superficial lymph-nodes are ordinarily to be felt. We have assumed (though without the actual removal and examination of any of these nodes) that we have to do with a *generalized* lymphadenitis, and this assumption has further justification in the percussion enlargement of the spleen—from the sixth rib to two fingers below the costal arch—though a definite edge cannot be felt. The significance of these findings will be commented on later.

The organs of the thoracic cavity show several variations from the normal; dulness over the upper sternum and overlapping the margins, particularly to the left (Figs. 3 and 4); and an apex beat and left cardiac border 1 cm. outside the mammillary line with some accentuation of the pulmonic second tone. There are no murmurs. The liver edge is to be felt two fingers' breadth below the costal arch, on deep inspiration, with a smooth surface and sharp edge; on percussion it is not enlarged to the left.

The secondary sexual characteristics are just appearing. Neither testicle is in the scrotum, but they can be pushed down, with little difficulty; the testicles and penis are perhaps small for the age. The reflexes are all present and normal. There is no ankle edema. Examination of the blood (Wittemann[8]) shows: erythrocytes, 5,240,000, hemoglobin, 85, leukocytes, 9,400, distributed as follows: polynuclear neutrophils, 65.5 per cent., lymphocytes, 27.0 per cent., large mononuclears and transitionals 5.0 per cent., eosinophils, 2.0 per cent. and basophils, 0.5 per cent. Practically 90 per cent. of the neutrophils would fall into Classes II and III of Arneth's classification (Dr. Holmes). The Wassermann reaction (blood) is negative (Holmes). The systolic blood pressure is 90 mm.

May 2, a cutaneous tumor (chest wall), a deep tumor (left forearm) the tonsils and the carious molar tooth were removed by Dr. Kanavel. The tonsils were the seat of a chronic inflammation with ulceration (Dr. Zeit). The removal of the node from the forearm furnished a surprise. Before the incision, it was felt as a walnut-sized round tumor, but at operation there was found an egg-sized mass in a fine capsule, composed of several lobes and looking much like a combined fatty and myxomatous tumor of a jelly-like consistency. A careful dissection as to anatomic relations was not made, so that the association of the mass to adjacent nerves was not noted; immediately following the operation, however, partial wrist drop occurred with inability fully to extend the little finger.

Somewhat later there was removed from the left scapular region a tumor made up of convolutions of interwoven strands studded here and there with nodules (plexiform neuroma; *Rankenneurom*).

Microscopically (hematoxylin and eosin [Fig. 5]), the excised tumors showed the picture characteristic of von Recklinghausen's disease—a spongy, myxoma-like tissue with many meshes and without definite structure. Some of the spaces are lined with endothelial cells, but the bulk are formed by protoplasma-poor cells, all of about one size. With this stain the plasma-cells emphasized by Unna[8] are not seen. The Marchi method (Fig. 6) shows bundles of apparently normal axons in the tumor mass (Dr. Ranson).

Fig. 3.—Chest, anteroposterior, showing mediastinal mass capping the heart.

That we have to do with a case of neurofibromatosis is clear from the clinical manifestations, surgical sequelae and microscopic examination. The symptoms of the first order (Adrian) are all present, that is, tumors of the skin, tumors of the nerves and cutaneous pigment anomalies. Of the symptoms of the second order, so called—functional disturbances, intellectual and psychic changes, maldevelopment of various kinds, bone changes and the like—there is but little to be seen; and, indeed, in the majority of reported cases they are usually absent or only suggested. The headache and dizziness belong to the group of functional disturbances so far as we have been able to determine, for there is no evidence of an intracranial neurofibroma.

Of intellectual and pyschic anomalies there is no sign. The boy seems normal except for the lymphatic appearance already commented on.

In the category of developmental faults belongs the condition of cryptorchism. Bone changes not infrequently observed, scoliosis particularly, are absent; and there are no trophic disturbances.

8. Unna: Fibrome, Histopathologie.

Our patient exhibits, in brief, few findings which have not frequently been commented on by other observers. One unusual feature is the non-critical resemblance to Hodgkin's disease—the appearance of the first nodes in the cervical region, their initial enlargement, the generalized lymphadenopathy, the enlarged spleen, etc. For these we shall offer below a different interpretation. As for the organism cultivated from one of the nodes, we can offer no explanation save that it may bear some relation to bacterial

Fig. 4.—Chest, postero-anterior, showing same as Figure 3.

flora not uncommonly present in new growths. Cultures in our laboratory were sterile (Holmes).

The absence of large cutaneous tumors growing considerably about the skin level may be accounted for by the age of the process; they may be looked for later, or perhaps this is one of the forms which tends to involve the deeper nerve filaments rather than the cutaneous.

There is no congenital, hereditary or familial aspect to this case—a feature so striking in many observations. The patient falls into that rather large class which shows no evidence at birth of the coming condition and begins to develop it at puberty.

As to nomenclature, many observers, notably von Recklinghausen,[8] Adrian[5] and Orth,[9] have taken exception to the name neurofibromatosis as representing incorrectly the nature of the growth. That the growths are not essentially of nervous origin is well known; that they arise from the neurilemma sheaths or from the fibrous investment of certain cutaneous appendages or subcutis or perhaps from both structures, is generally accepted.[10] Their origin from an embryonic nervous tissue has been advocated in late years.[11] Hence the name neurofibromatosis is not apt in that it attributes to nervous tissue proper a false participation in the process. False neuroma is no improvement. Adrian's suggestion of the term "von Recklinghausen's disease" seems to him the best and least open to adverse criticism. French observers generally employ this term.

There remains now the consideration of the many theories put forth from time as to the actual nature of von Recklinghausen's disease. Adrian reviews the ideas held up to the year 1903. All observers who have expressed an opinion on the point are agreed that it is a disease which comes into being through some general impetus; it is a system disease affecting a particular tissue (Verocay[12]). The infectious, the toxic, the traumatic and the sympathetic influence theories are to-day no longer generally put forth, though Pic and Gauthier[13] in 1907 point out the close association of the condition with tuberculosis. We shall refer later to the view of Chauffard and others that the adrenals are affected.

The view most generally advocated and the one best founded is that the condition arises on an inborn tendency—an anlage—which exerts its influence at variable times after birth and leads to the proliferation of the fibrous tissue making up the neurilemma sheaths.

It is our opinion, however, based on certain peculiarities of the case we have reported, on features of cases we have collected from the literature, and on general considerations, that von Recklinghausen's disease belongs to the larger congenital anomaly known as the status thymicolymphaticus sive hypoplasticus. Space forbids our entering in any detail, into the complexities of this condition, to which so much attention has been devoted of recent years.[14] Speaking for the condition in our case are the peculiar lymphatic facies, the hypertrophic faucial lymphatic ring, the generalized lymphadenopathy, the enlarged spleen, the persistent and enlarged thymus, the scanty axillary and pubic hair, the cryptorchism, the small testicles and penis, and the very tendency toward tumor formation —particularly multiple. All of these go to make up the thymicolymphatic and hypoplastic status, or condition of structural inferiority (*Minderwärtigkeit*).

Fig. 5.—Microscopic section of tumor removed from the left forearm, hematoxylin-eosin stain, × 450, showing loosely interwoven texture, marked edema of stroma and cells made up almost entirely of nuclei.

Other observers have not noted this association of the lymphatic status with von Recklinghausen's disease. We have been able, however, to collect from this case or that, one or more recognized attributes of the

9. Orth: Deutsch. med. Wchnschr., 1911, p. 473.
10. Jarisch: Hautkrankheiten, Wien und Leipzig, 1908, p. 810 (literature of this phase).
11. Kohn: Arch. f. mikr. Anat., 1907, lxx (quoted by Verocay, Footnote 12).
12. Verocay: Beitr. z. path. Anat. u. z. allg. Path., 1910, xlviii, 1.
13. Pic and Gauthier: Lyon méd., 1908, cxl, 1148.
14. Bartel: Status Thymico-Lymphaticus und Status Hypoplasticus, Wien, 1911. Von Neusser: Ausgewählte Kapitel d. klin. Symptomatologie und Diagnostik H. 4. Zur Diagnose der Status Thymico-Lymphaticus, Wien, 1911. Wiesel, Status Thymico-Lymphaticus, in Lewandowsky: Handbuch d. Neurologie, Berlin, 1913, p. 380 (literature).

anomaly. Sabrazés[15] notes the generalized lymphadenopathy, Klinger[16] the absence of pubic hair. Wittemann[7] in his cases observed a mononucleosis regularly. In Ehrmann's[17] case the hands of the patient reached almost to his knees—a disproportion frequently observed in the status lymphaticus. Various malformations are generally looked on as one of the symptoms of the second order belonging to von Recklinghausen's disease. For a compilation of these, we would refer the reader to Adrian's monograph.[18]

Very striking in a number of case histories has been the early and unexplained lethal ending after operation on large tumors which offered no technical difficulty. Among such records are cases reported by Piollet,[19] Lambret and Gérard,[20] and Littlewood, Telling and Scott.[21] Though these are not strictly instances of thymic death, they are to be ascribed in all probability to a lack of resistance.

It would appear to us, therefore, that closer examination, in the future, directed particularly to evidence of the presence of stigmata of the status thymicolymphaticus, would furnish convincing proof of the association of the two conditions.

Another phase of von Recklinghausen's disease which has been cursorily treated in the last decade, particularly by French writers, is the influence of the glands of internal secretion in the process. Again we refer to Adrian for assembled instances, up to the year 1903, of involvement of the ductless glands and for symptoms referable thereto. Chauffard and Ramond[22] in 1896 advocated the adrenal theory of the origin of the disease, basing their opinion on the generalized pigmentation, the commonly observed asthenia, gastro-intestinal disturbances and other evidences of adrenal insufficiency. In two of their cases coming to necropsy adrenal changes were discovered, in one an adenoma, in the other atrophy. The adrenal theory, though never of general acceptance, has received a great deal of consideration by many observers.

The majority felt that the association was merely a coincidence. (We would call attention, however, to a recognized pathologic fact, namely, that Addison's disease is almost constantly accompanied by stigmata of the status lymphaticus.) Adrian[5] rejects the adrenal theory, citing the various observations bearing on the relationship. Merk[23] in his case found changes in the left adrenal and cannot entirely disregard Chauffard's view. The chromaffin system was found hyperplastic in Orzechowski's[24] patient. Gabriel[25] and others have observed good results from the use of adrenal extract. Vignolo-Lutati[26] observed a well-developed Addison complex in his case. Revilliod[27] and Pic and Rebattu[28] comment on the frequent association of the two conditions, as do Bourcy and Laignel-Lavastine.[29] Mucous membrane pigmentation was noted by Oddo.[30]

Thyroid disturbances are also of frequent occurrence. Adrian has gathered several instances of the association of von Recklinghausen's disease and cretinism.[31] Pic and Rebattu[28] found thyroid changes. In one of his cases Ehrmann found a small thyroid, in the other an absence of the gland. It is interesting to note that joint changes are not infrequently present in disturbances of the ductless glands. Preble and Hektoen[32] report a case of von Recklinghausen's disease associated with arthritis deformans. And, furthermore in the latter condition, thyroid extract has been used with favorable results (Midelton,[33] Llewellyn[34]). It is scarcely necessary to recall here the close relationship of thyroid, sexual glands and thymus.[35]

Fig. 6.—Microscopic section of plexiform neuroma (see text) stained by Marchi method, showing bundles of nerve fibers loosely separated by edematous tumor stroma; × 60.

Of the behavior of the thymus we have found no record. Functional sexual disturbances—impotence, frigidity, diminished libido—are noted by Adrian. Orzechowski[24] found ovaries below par. Meige and Feindell[36] note ovarian disturbances. Osteomalacia is very frequently observed, as for example by Gabriel,[25] Klinger,[37] Wechselmann[38] Marie and Couvelaire[39] and Hoisnard.[39] Menstrual anomalies are of frequent record (Adrian).

15. Sabrazès: Gaz. hebd. d. sc. méd. de Bordeaux, 1911, xxxii, 591.
16. Klinger: Berl. klin. Wchnschr., 1912, xlix, 1491.
17. Ehrmann: Wien. klin. Wchnschr., 1904, xvii, 139.
18. Adrian: Centralbl. f. d. Grenzgeb. d. Med. u. Chir., 1903, vi, 465.
19. Piollet: Gaz. d. hôp., Dec. 4, 1902, p. 1345.
20. Lambret and Gérard: Écho méd. du nord, 1908, xii, 30.
21. Littlewood, Telling and Scott: Lancet, London, 1905, i, 921.
22. Chauffard and Ramond: Bull. et mém. Soc. méd. d. hôp. de Paris, 1896.
23. Merk: Arch. f. Dermat. u. Syph., 1905, lxxiii, 139.
24. Orzechowski: Ztschr. f. d. ges. Neurol. u. Phychiat., 1912, xi, 231.
25. Gabriel: Berl. klin. Wchnschr., 1911, xlviii, 133.
26. Vignolo-Lutati: Monatschr. f. prakt. Dermat., 1911, lii, 51.
27. Revilliod: Thèse de Genève, 1900, quoted by Vignolo-Lutati, Footnote 26.
28. Pic and Rebattu: Lyon méd., 1907, i, 636.
29. Bourcy and Laignel-Lavastine: Bull. et mém. Soc. méd. d. hôp. de Paris, 1905.
30. Oddo: Revue neurol., 1905, xiii, 412.
31. Strohmeyer (1844) and Schuh (1851, 1854), quoted by Adrian (Footnote 5), p. 461.
32. Preble and Hektoen: Am. Jour. Med. Sc., 1901, cxxi, 1.
33. Midelton: Practitioner, lxxxviii, 11, 80.
34. Llewellyn: Edinburgh Med. Jour., 1904.
35. Lampé: Deutsch. med. Wchnschr., 1912, p. 1127. Capelle: Beitr. z. klin. Chir., 1908, lviii, 353.
36. Meige and Feindell: Revue neurol., 1903, n. 157.
37. Klinger: Berl. klin. Wchnschr., 1912, xlviii, 1400.
38. Wechselmann: Dermat. Stud., 1910, xx, 133.
39. Cited by Adrian (Footnote 5).

Schlesinger,[40] in his case found an associated tetany. This is the only recorded instance of parathyroid involvement. We have found no reference to pancreas changes except for a normal organ in Orzechowski's[24] case.

Numerous observers record the simultaneous involvement of the hypophysis. Prognathism without further comment is a common observance. Acromegaly and von Recklinghausen's disease are chronicled by De Castro,[41] Wolfsohn and Marcus,[42] Cushing,[43] Nicholas and Favre[44] and others. Thomas[45] observed fingers and lower jaw suggestive of acromegaly; Feindel and Frounard,[46] an acromegalic skull contour. A tumor of the sella turcica was present in Spillman's[46] case; in Mossé and Cavalie's[46] an enlarged and hard hypophysis was found. Piollet[19] records pituitary insufficiency and also acromegalic facies and extremities.

That von Recklinghausen's disease may be a manifestation of pluriglandular disturbances has been noted by several writers, notably Pic and Rebattu,[28] Orzechowski[24] and De Castro.[41] Their deductions have been based, however, on symptoms shown by their own cases; no observer, to our knowledge has heretofore collected extensive data from the literature showing the not uncommon occurrence of ductless gland disturbances in generalized neurofibromatosis.

Direct proof that von Recklinghausen's disease is part of the larger congenital anomaly known as the status thymicolymphaticus, or that the secretions of the ductless glands play a part in its production, cannot of course be adduced. The close interweaving of the lymphatic status and ductless gland affairs is well known; and considerable evidence is at hand to indicate that von Recklinghausen's disease is a manifestation of both. This is particularly understandable if one admits the embryonic nature of the tissue forming the tumors.

NOTE: Dercum's disease, adipositas dolorosa, has received considerable attention of late as an internal secretion disorder. In its tendency toward multiple tumor formation it resembles von Recklinghausen's disease. It is of interest to note that in the latter, lipomas are of frequent occurrence.[47]

30 North Michigan Avenue—122 South Michigan Avenue.

40. Schlesinger: Mitt. d. Gesellsch. f. inn. Med. u. Kinderh., in Wien, 1911, x, 124.
41. De Castro: N. iconog. de la Salpêtrière, 1912, xxv, 41.
42. Wolfsohn and Marcus: Berl. klin. Wchnschr., 1912, xlix, 1088.
43. Cushing: The Pituitary Body and its Disorders, Philadelphia, 1912, p. 148.
44. Nicholas and Favre: Lyon méd., 1910, cxiv, 786.
45. Thomas: Bull. Johns Hopkins Hosp., 1903, xiv, 204; also Maryland Med. Jour., 1903, xlvi, 82.
46. Cited by Wolfsohn and Marcus (Footnote 42).
47. Cushing (Footnote 43): Von Stejskal, Mitt. d. Gesellsch. f. inn. Med. u. Kinderh., 1907, vi, 153.

Vis Medicatrix Naturae.—One of the most interesting facts in regard to the regenerative capacity—Nature's power of healing—is its adaptive distribution. It tends to occur in those animals and in those parts of animals which, in the natural conditions of their life, are particularly liable to non-fatal injury. Long-legged and lanky animals like crabs and star-fishes usually show much of it; a self-contained globular animal like a sea-urchin shows little. The chameleon is one of the few lizards which cannot regrow its tail, for it keeps it safely coiled around the branch. Another very interesting fact is that what is regrown is not always quite true to pattern—the crab does not always get an eye for an eye, but it may be an antenna for an eye. The lizard does not always regrow its own tail, but its grandfather's, so to speak.—J. Arthur Thomson, *Brit. Med. Jour.*

SPONTANEOUS SUBARACHNOID HEMORRHAGE

A CONTRIBUTION TO THE SUBJECT OF MENINGEAL HEMORRHAGE*

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Aside from the rare pachymeningitis hemorrhagica interna, and the traumatic pial hemorrhage, there has been no recognition of a spontaneous subarachnoid hemorrhage. Although this symptom-complex has been elaborately studied by Froin,[1] Chauffard,[2] Vigneras[3] and others among the French writers, little or nothing is mentioned of the subject by the American, English or German writers, Starr, Dana, Mills, Oppenheim, Finkelburg in Lewandowsky's[4] handbook, Schultze in Nothnagel's "System," and others.

In describing meningeal hemorrhage, Gowers does not differentiate the subarachnoid from the other forms, but his description corresponds very closely to this type. He says:

> Blood may be extravasated, (1) outside the dura, separating it from the bone; (2) beneath the dura; (3) beneath the arachnoid between it and the pia (subarachnoid hemorrhage). . . . Meningeal hemorrhage occurs apart from visible aneurysm under the same conditions as hemorrhage elsewhere in the brain. . . . In some cases in young adults, the occurrence of meningeal hemorrhage is probably indicated by intense pain in the head at one spot, soon followed by coma and convulsions. The cases are remarkable as occurring without other exciting cause than exertion in a hot room, or sometimes after a meal.

Froin, in 1903, collected some reports of cases of subarachnoid hemorrhage but he included the traumatic form among them. Ehrenberg[5] was the first to separate the spontaneous subarachnoid hemorrhage from the rest. He reports two of his own, and analyzes twenty-seven other cases. He distinguishes two varieties, the one in which the meningitic picture predominates; the other an apoplectic onset, with coma or cerebral type. Since then Babinski[6] and Jumentie report two cases, and Forsheim[7] one.

Two of my cases illustrate the apoplectic form, and one the meningitic.

CASE 1.—B. Y., white, aged 59, married, was admitted to the hospital April 25, 1910. Present illness began suddenly with vomiting, headache, pain in the epigastrium and stupor. (I had no opportunity of studying this case clinically and the notes taken are very meager.) The pupils were equal, reacted to light and accommodation. There were no paralyses. The patient died the next day. No clinical diagnosis was made.

At necropsy, examination of the brain showed a hemorrhage beneath the arachnoid at the base. It extended forward to the frontal lobes, and surrounded the optic chiasm. It covered the under surface of both the pons and the medulla. It covered the inferior surfaces of both hemispheres of the cerebellum. The convexity of the brain was free from hemorrhage. There was no evidence of meningitis or throm-

* Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Froin: Thèse de Paris, 1904. Froin and Boidin: Gaz. d hôp. 1904, p. 9.
2. Chauffard and Boidin: Presse Méd., 1903.
3. Vigneras: Thèse de Paris, 1908.
4. Lewandowsky: Handbuch de Neurologie.
5. Ehrenberg: Hygeia, 1912, p. 849.
6. Babinski: Soc. méd. d. hôp. d. Paris, 1912.
7. Forsheim: Deutsch. Ztschr. f. Nervenh., 1913, xlix.

bosis. The skull showed no sign of fracture. Sections were taken from the pons and medulla for microscopic examination. Hemalum-fuchsin and Weigert stains were used. Sections of the cerebellum and the pons stained with hemalum-fuchsin showed a considerable collection of red blood-cells beneath the pia-arachnoid. The pia showed a considerable round-cell infiltration of the lymphocytic type. The blood-vessels showed periarteritis and endarteritis. The infiltration of cells around the vessels was intense in places. In two of the vessels in the pons the lumen was almost occluded. In the medulla, similar pathologic changes were noted. Sections of the pons and medulla stained with the Weigert showed a slight border-zone degeneration.

The pathologic picture was that of a syphilitic meningitis. Clinically, this case is interesting despite the meager notes, in that the onset is characteristic of this form of hemorrhage, and shows the apoplectiform type of seizure. The meningitic origin of the hemorrhage was only discovered on microscopic examination. As far as I can learn, no microscopic study of this condition has ever been reported.

The second case also illustrates the apoplectic form with coma.

CASE 2.—H. M., an unmarried colored laundress, aged 19, with negative family history and previous medical history, two months ago had pelvic trouble, said to have been inflammation of the tubes. Patient had been well until the morning of her admission to the hospital, when she came home, complaining of severe headache, with vomiting. She went to her room, where she was found unconscious several hours later. She was admitted to the hospital that evening, Dec. 13, 1913, where she died several hours later.

Physical examination showed a young, well-developed girl. The pupils were unequal. There was rigidity of the neck, and spasticity of the lower limbs. Both patellar tendon-reflexes were increased. Babinski was present on both sides. The upper limbs were flaccid. The respirations were of the Cheyne-Stokes' type. Temperature, 100.4 F. The urine analysis showed no albumin, sugar or acetone. Microscopic examination, negative. The diagnosis of subarachnoid hemorrhage was made, and lumbar puncture advised. The possibility of a meningitis was also considered. Hysteria was easily excluded. Uremia and diabetic coma were excluded by the urinary findings. There was no history or visible sign of trauma. Lumbar puncture was made, and the fluid came out drop by drop, somewhat rapidly, until twenty c.c. were collected in two tubes, and both showed a diffuse red color, considerably lighter than pure blood. On standing, no clot was to be noted in either tube, only a slight granular sediment. Centrifuging the fluid showed the supernatant fluid of a yellow color. The Wassermann reaction was negative. No relief followed the withdrawal of the fluid. One hour later the patient died. No necropsy was permitted.

Summary.—A young woman, previously healthy, suddenly was seized with headache, vomiting and unconsciousness. The symptoms present were rigidity of the neck, and spastic paralysis of the lower limbs with Babinski. Clinical diagnosis, spontaneous subarachnoid hemorrhage.

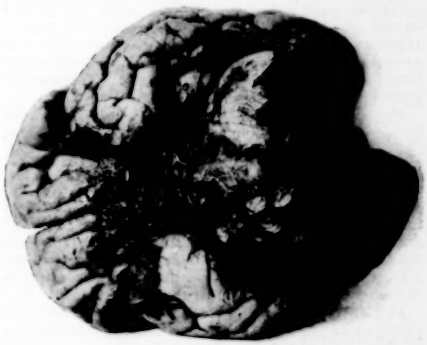
CASE 3.—Italian stone-worker, aged 23, family history and previous medical history negative, one month ago complained of fever, backache, headache and general weakness. He was treated in an Italian hospital for two weeks, and was apparently cured, though still weak. Five days after his discharge he suddenly developed severe headache, pain in the back of the neck and persistent vomiting, and was admitted to the hospital, complaining of his head and pain in the back of the neck.

Examination showed a young man of fair nutrition, somewhat apathetic. When questioned, patient pointed to his head. Pupils were equal, reacted to light and accommodation. There was rigidity of the neck. The limbs showed no paralysis. Kernig's sign was present. The knee-jerks were absent. There was no Babinski or ankle-clonus. The eye report showed deviation of the eyes to the right, though at times they moved to the median line. The media were clear, the disk margins slightly hazy, but the vessels were neither engorged nor tortuous. Ear examination was negative. Temperature 100 to 101.4. The lungs showed slight impairment. The diagnosis was subarachnoid hemorrhage with tuberculous diagnosis was subarachnoid hemorrhage with tuberculous meningitis. Lumbar puncture was ordered.

At necropsy, the viscera showed a general miliary tuberculosis. The brain showed miliary tubercles scattered over the convexity and at the base along the vessels. Besides a subarachnoid hemorrhage at the base extended from the optic chiasm over the peduncles, slightly involving the temporal lobes on each side, and also over the pons and cerebellum. The hemorrhage was most marked in the right cerebellopontile angle. There was some hemorrhage over the vermis. The convexity of the cerebral hemispheres was free from hemorrhage.

Summary.—Young man. History of general weakness for a month. Five days before admission to the hospital was seized with headache, vomiting and meningitic symptoms. Examination showed rigidity of the neck, Kernig's sign, loss of knee-jerks, no Babinski, no paralysis of the limbs. Clinical diagnosis; tuberculous meningitis, with subarachnoid hemorrhage. Pathologic Summary: General miliary tuberculosis of lungs, liver, kidney and brain, subarachnoid hemorrhage.

There is some doubt whether this case should be classified among the pure forms of subarachnoid hemorrhage. The picture here is rather that of a secondary complication in the course of a miliary tuberculosis.



Area of hemorrhage in Case 1.

The sudden onset in these cases with meningeal symptoms, with or without coma, the disproportion between the onset, severity of the symptoms, and the range of temperature, the presence of hemorrhage in the cerbrospinal fluid, will usually differentiate this condition from other cerebral states. It may not always be possible to prove a primary meningitis as the underlying factor. The etiology has been variously ascribed to sunstroke, as in Bouquet's[8] case, in which the patient, following prolonged exposure to the sun, suddenly developed rigidity of the neck, headache and Kernig's sign. Lumbar puncture showed hemorrhage. Relief of symptoms followed immediately. Disturbed or aberrant menstrual function was the cause, according to Follet and Chevrel[9] and Gaillard and Boyé,[10] in their cases.

Follet and Chevrel's patient, a domestic, aged 21, was suddenly seized during the menstrual period with

8. Bouquet: Ref. Rev. Neurol., 1909.
9. Follet and Chevrel: Gaz. d. hop., 1910, p. 547.
10. Gaillard and Boyé: Bull. Soc. méd. d. hôp d. Paris, 1909, p. 1268.

weakness, and fell to the floor unconscious. She awoke with intense headache and had persistent vomiting with symptoms of meningeal irritation. Lumbar puncture showed hemorrhage.

In Gaillard and Boye's case, there was no evidence of trauma, syphilis, exposure, emotion or infection. The interesting fact was noted that an amenorrhea following oophorectomy had existed for one year.

Violent emotion is attributed as the cause in one of Froin's cases, overexertion in Forsheim's. Syphilis was noted in seven of the cases reported. Tuberculosis was present in one of Froin's cases, and in my Case 3. Chronic nephritis and hemophilia have also been reported as causes. It is possible that meningitis will prove to be the underlying cause in the majority of cases. Babinski believes that syphilitic meningitis plays a distinct rôle in these cases.

The localization of the hemorrhage at the base, so characteristic of this form of hemorrhage, would add further support to the meningitic origin.

While the symptomatology in the cases I report and those found in the literature shows the ordinary signs of meningeal irritations and coma, several features impress themselves. Headache was localized either over the occiput, or at the base of the neck. Sometimes the pain radiated down the spine and in one of my cases was localized over the epigastric region. Rigidity of the neck and Kernig's sign were present in two of my cases, and one or other of these symptoms was present in all cases reported. This meningitic picture is most favorable for recovery.

Coma may be the initial symptom, followed either by death or the appearance of meningeal symptoms. In a few cases a condition of recurring coma was noted. All the fatal cases showed coma.

Jacksonian convulsions were noted by Froin and Babinski. In these cases the hemorrhage had escaped to the cortex and clots were found over the motor area. The reflexes were increased in some cases and absent in others. Babinski's sign was also inconstant. The paralytic symptoms were manifold, according to the extent and localization of the hemorrhage.

Ocular palsies, conjugate deviations of the eyes, paralysis of one or more limbs, transient hemianopsia, all have been noted.

The value of lumbar puncture in these cases is apparent. In all suspected or doubtful cases in which lumbar puncture was performed, the presence of blood without clot was obtained. Many of these cases were confirmed by necropsy. In fact, according to Follet and Chevrel and others, no diagnosis can be made without lumbar puncture.

The accidental puncture of a vessel during the procedure may be distinguished, according to Milliet, from subarachnoid hemorrhage by collecting the cerebrospinal fluid in three tubes. The former will show streaks of blood in the clear fluid, also the presence of clot, while the latter is a diffuse red throughout, and shows no clot. Centrifuging the fluid will also show the supernatant liquid of a yellow or slightly reddish tinge. According to Widal,[11] this is the only pathognomonic sign of hemorrhage. In only one other condition, that of jaundice, is this sign to be found.

Lumbar puncture has proved of therapeutic value in some of the cases, relief following one or more punctures.

348 South Sixteenth Street.

11. Widal: Presse méd., 1903.

ABSTRACT OF DISCUSSION

DR. WILLIAM W. GRAVES, St. Louis: Doubtless not a few cases of subarachnoid hemorrhage occur in general paretics. I doubt not that some cases of the stuporous meningitic type are seen by the practitioner and are considered to be of a hysterical nature. Dr. Leopold has emphasized the value of the diagnostic aids which have come to us and which have given such excellent results during the last few years, especially lumbar puncture, and this, with the suddenness of the onset, usually in the comparatively young, make the diagnosis almost certain in the condition described by him.

PRIMARY CARCINOMA OF THE LUNG

SECOND COMMUNICATION

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Two recent advances have helped to make this subject one of growing importance. These are (1) the rapid development of intrathoracic surgery, and (2) the introduction of radio-active substances in the treatment of malignant disease. In this condition, as in malignant disease generally, any therapeutic procedure that is intended to be curative must be applied before the process has gone too far. Early diagnosis of this disease is, therefore, one of its most important practical considerations. With a better realization of the importance of this clinical entity, perhaps the problem of early diagnosis would be made easier. It is with the idea of stimulating a more general interest in this type of pulmonary disease that a new case is now added and attention briefly called to the more important clinical features of such cases.

The literature on this subject is growing rapidly. In 1912 Adler[1] published his admirable monograph, which is, indeed, the best and most comprehensive work written on this subject thus far. He succeeded in collecting the records of 374 cases of primary lung carcinoma. In the same year I[2] submitted a very limited review of the literature with the report of an additional case. The particularly noteworthy feature in that case was the occurrence of a focal encephalomalacia, probably due to metastatic emboli to the cerebral vessels supplying the affected areas. In that year Weil[3], also, reported a case in which necropsy revealed primary adenocarcinoma of the right bronchus with extension to the pericardium and metastases to the peribronchial glands, liver, right adrenal and pancreas; and Ephraim[4] reported several cases in which a clinical diagnosis was made by means of bronchoscopy. It is generally understood, however, that for accurate statistical purposes only authenticated cases should be included, and such cases are those in which microscopic evidence as to the nature of the neoplasm is obtained. For the same reason such clinical reports as those of Swan[5] and of Freeman[6], the latter with very incomplete and the former with no pathologic data, are open to justifiable criticism.

In 1913 appeared Weller's[7] collection of what he termed "the authenticated cases of primary carcinoma

1. Adler: Primary Malignant Growths of the Lungs and Bronchi, 1912.
2. Edlavitch, B. M.: Primary Carcinoma of the Lung, THE JOURNAL A. M. A., July 20, 1912, p. 171.
3. Weil: Fortschr. a. d. Geb. d. Röntgenstrahl., 1912, xix, 2; abstr., Jahresb. f. Chir., 1913, p. 453.
4. Ephraim: München. med. Wchnschr., 1912, lix, 1517.
5. Swan: Med. Rec., New York, 1913, lxxxiv, 888.
6. Freeman: New York Med. Jour., 1913, xcvii, 350.
7. Weller, C. V.: Primary Carcinoma of the Larger Bronchi, Arch. Int. Med., March, 1913, p. 314.

of the larger bronchi," including a new case described by himself. Only those cases were included which met the requirements he set up as the criterion of authenticity. A total of only ninety such cases was found by him in the literature. Other important contributions during that year were those of Buchstab[8] and von Wiczkowski.[9] The former reported eleven cases in a series of 2,089 necropsies during 1910-1911. In three of the cases the clinical diagnosis was correctly made. In the fourth, empyema was suspected and thoracotomy revealed two abscesses, but necropsy showed a carcinoma that seemed to have its origin in a thrombus. The latter observer gives briefly the data of six additional cases, in four of which the diagnosis was made *intra vitam*. Hermann's[10] case report must also be mentioned. Here was present an associated chronic cicatrizing pulmonary tuberculosis, and it is Hermann's[10] belief that the irritation produced thereby stimulated the formation of the lung cancer. This coincidence of primary carcinoma with tuberculosis in the lung has been noted often enough to arouse considerable discussion on the significance of this association.

During the present year an article by Inada[11] entitled "Primary Carcinoma of the Lung" has already appeared in Japanese literature. For obvious reasons this publication can only be referred to here. Two other cases added this year are the one reported by Marschik,[12] who stated that in his case the postmortem finding was such that he was led to believe that a resection of the lung might have been possible, and the one reported by Schlesinger and Schopper,[13] who describe a case of primary bronchial cancer with metastases to the mediastinal glands, the stomach and intestines.

From such a large mass of accumulated reports it must be evident that carcinoma originating in the lung or bronchi is not at all as rare as has been generally thought. Indeed, is it not rather to be expected that an organ so rich in epithelial elements should not infrequently be the seat of epitheliomatous or carcinomatous change? Certainly it seems that the condition occurs often enough to warrant what Adler[1] says, that the physician "may meet it any day in his practice among the young, as well as among the old."

The following case is from the private practice of Dr. G. W. McCaskey, to whom grateful acknowledgment is made for permission to report it.

History.—The patient, Mrs. C. A. C., aged 64, came in complaining of shortness of breath, cough, and swelling of her right arm. The family history and past history were entirely unimportant. Her illness began about one year ago when she "caught cold" and began "to hack and cough." Since then she had been troubled with this persistent cough. At times the paroxysms of coughing seemed to bring on nausea. She had had several slight hemorrhages after coughing. There was considerable expectoration, and raising of sputum seemed to give some relief. Lately she became markedly dyspneic, and felt as if she "filled up" after exertion. She said there had been no pain, no night sweats, no headache and no fever. During the past four or five weeks her right arm gradually became swollen. She had lost about 50 pounds in weight since the onset of her trouble.

8. Buchstab: Zentralbl. f. Chir., 1913, xl, 412.
9. Von Wiczkowski: Wien. klin. Wchnschr., 1913, xxvi, 1067.
10. Hermann: Ztschr. f. Krebsforsch., 1913, xiii, No. 3; abstr., Berl. klin. Wchnschr., 1914, li, 78.
11. Inada: Sei-i-Kwai Med. Jour., 1914, xxxiii, 1.
12. Marschik: Abstr., Berl. klin. Wchnschr., 1914, li, 141.
13. Schlesinger and Schopper: Abstr., Berl. klin. Wchnschr., 1914, li, 335.

Examination.—Patient was pale and emaciated. Her voice was weak and very hoarse, and there was marked inspiratory dyspnea. There was definite puffiness of the face and very marked diffuse edema of the right forearm and hand. The right clavicle was bulging, and situated posterior to it was a hard swelling, the contour of which could not be determined. Over this region there was some tenderness. The chest was asymmetrical, the left side being distinctly fuller than the right. Characteristic board-like dulness was obtained on percussion over the upper half of the right chest both in front and behind. Over this dull area the breath sounds were harsh and a few moist râles were heard. Pulse was regular, 92; temperature, 99.4; blood-pressure (systolic), 110. Nothing of importance otherwise was found on physical examination. The urine contained some albumin with a few hyaline and finely granular casts. Phenolsulphonephthalein output was 46 per cent. The blood examination showed hemoglobin 70 per cent., 4,150,000 red cells, 14,800 leukocytes, and a differential count as follows: polynuclears 79, small lymphocytes 15, large mononuclears 3, transitionals 2 and eosinophils 1 per cent.

The patient entered Hope Hospital, and remained until December 11. A Roentgen examination of the thorax was made by Dr. B. P. Weaver, whose report was, "Whole mediastinum and right apex occupied by a growth which also extends to left of aortic border."

The sputum was abundant, mucopurulent and very often bloody, and on repeated examination no acid-fast bacilli could be found. It should here be added that two examinations of the sputum made in the laboratory of the State Board of Health before the patient came under our observation were also reported as "negative."

Clinical Diagnosis.—In view of the similarity of many of the clinical features of this case to the one which I previously observed and reported, the true nature of this condition was readily recognized and a clinical diagnosis promptly made of "carcinoma pulmonis."

December 11, patient left the hospital, but returned six days later. Her condition continued to become progressively worse. Jan. 2, 1914, her sputum was streaked with bright-red blood, and this continued more or less until exitus. January 6 she had a very bad "choking spell" that was almost fatal. The following day her breathing became worse and finally respiration ceased at 10 p. m. that day.

Necropsy (abstract).—Lab. No. 14-3, Jan. 8, 1914, 8 a. m. Anatomic diagnosis was primary carcinoma of lung, involving right upper lobe; metastasis to bronchial lymph-nodes and to right axilla; chronic bronchitis and tracheitis; arteriosclerosis; chronic nephritis; diffuse edema right upper extremity.

The upper half of the right lung was so firmly adherent to the chest-wall and mediastinum that it was removed with great difficulty and was torn. The right upper lobe felt hard and nodular, and on section was found to be studded with grayish opaque nodules and masses. A small cavity about 1.5 cm. in diameter, filled with cheesy-like material, was present in this lobe. Much grayish, stringy, mucopurulent debris could be squeezed out on pressing this lobe. A very small calcareous nodule was found on the pleural surface near the apex. The glands at the hilum were large, hard and filled with an abundance of greenish-black pigment. There was marked peribronchial and peritracheal thickening. In the right axillary space extending up to the sternal half of the clavicle and the first rib in front and to the scapula behind was found a small, irregular, very soft and friable, granular-looking mass which was intimately attached to the thickened surrounding tissues. Chronic bronchitis and tracheitis, a mild degree of generalized arteriosclerosis, and chronic nephritis were the only other pathologic changes worthy of note. The brain and cord were not examined (permission not granted).

Microscopic Examination.—Histologic study showed that the lesion was a squamous-cell carcinoma and that it originated from the bronchial mucous membrane. The cancer cells seemed to be everywhere grouped into a definite alveolar

arrangement. Degenerative changes in these cells were numerous so that there resulted considerable necrosis in areas of the tumor tissue. In one of the microscopic fields a very important change was observed at a certain point. Here was found a very definite proliferation or overgrowth of the epithelial cells lining the bronchiole and the characteristic change in the morphology of the proliferating cells from the cuboid to the squamous variety. Here seems to have occurred the metaplasia in the epithelium of the mucous membrane from the normal to cancer. This field is shown in the photomicrograph reproduced here. Cancer cells were also found in the lymph-channels of the affected areas and in the lymph-nodes at the hilum. The mass in the axilla was made up of the same type of cell. No microscopic malignant changes were found in the other tissues examined.

SYMPTOMS AND SIGNS

Evidently these must vary with the size, situation, rate of growth, manner of extension and other characteristics of the neoplasm. Rarely cases have occurred in which there were no symptoms pointing to malignant disease of the lung. A characteristic symptomatology can not, therefore, be said always to occur. However, certain definite symptoms do seem to be fairly constant in very many of the cases. These are (1) shortness of breath, (2) cough, (3) pain, (4) weakness and loss of weight, and (5) pressure symptoms.

Photomicrograph showing (1) normal cuboid epithelium lining the bronchial wall; (2) its proliferation and transformation into the cancerous type of cell, and (3) the typical squamous carcinoma cells present in the bronchial lumen.

1. *Dyspnea.*—This most distressing symptom seems to be quite frequent. The shortness of breath usually progresses, and as it becomes more severe the patient's physical condition becomes correspondingly more desperate.

2. *Cough.*—This troublesome symptom also seems to occur very often. It has been described as a "dry" cough and as a "moist" cough. It is nearly always continuous, so that it has been termed "tussis perpetua." With it there is almost always an abundant mucopurulent, bloody expectoration. The degree of hemoptysis may vary, the sputum at times showing only a few red streaks, at others a liberal amount of bright-red blood.

3. *Pain.*—Pain on the affected side or even radiating to the other side and to distant parts occurs frequently. It is said to be not so severe as the pain in an acute inflammatory pleuritis, but when it does occur it seems to be persistent and does not disappear with the onset of a pleural effusion. This symptom has not been noted in the two cases which I have observed.

4. *Weakness and Loss of Weight.*—Progressive loss of weight and of strength seem to be very important clinical features.

5. *Pressure Effects.*—The symptoms caused either by extension of the tumor to adjacent structures or by its metastases must obviously be extremely variable. The change in voice, the inspiratory dyspnea and the edema of the right arm noted in the case here reported are typical examples. Such symptoms when present may be very helpful or, on the other hand, somewhat confusing in the diagnosis.

In the clinical findings perhaps the most important is that typical dull percussion note which has been characterized as *brettharte Dämpfung.* With this are associated various changes in the voice and breath sounds. The pulse-rate is increased in spite of the absence of fever and night sweats. The presence of a bloody pleural effusion—in which diagnostic cells have been found—and the absence of acid-fast bacilli in the sputum are very important as aids in the differential diagnosis. Rarely such bacilli have been found in the sputum, for the coincident occurrence of pulmonary tuberculosis has already been noted. Obviously in cases in which tubercle bacilli are found the diagnosis becomes complicated and correspondingly more difficult.

DIAGNOSIS

In cases exhibiting these clinical manifestations where the possibility of primary lung cancer must be considered, the following practical methods should help in establishing a definite diagnosis, namely, (1) roentgenoscopy, (2) bronchoscopy, and (3) thoracotomy.

1. *Roentgenoscopy.*—In obscure thoracic conditions Roentgen examinations are now being regarded as almost indispensable. As a diagnostic aid they are very helpful when used in association with all the other obtainable data. Wiczkowski's[5] warning should here be emphasized: "They (Roentgen rays) should be used merely to confirm the clinical diagnosis." The fact that a large number of cases were diagnosed *intra vitam* by Otten[14] and by Müser[15] with the help of the Roentgen ray demonstrates the great practical value of such examinations.

2. *Bronchoscopy.*—The bronchoscope may be used successfully in determining the nature of the pathologic process. Direct examination of the affected parts or the excision of a fragment of diseased tissue for microscopic study whenever possible can give information that will "clinch the diagnosis." By this method Karrenstein[16] was able to observe the tumor arising from the right main bronchus of his patient, and von Schrötter[17] in a case of his excised a piece of the tissue for microscopic examination. Ephraim's[4]

14. Otten: Fortschr. a. d. Geb. d. Röntgenstrahl., 1906, ix, 369.
15. Müser: Mitt. a. d. Hamburg. Staatskrankenanst., 1906-1908, viii, 111.
16. Karrenstein: Charité-Ann., 1908, xxxii, 315.
17. Von Schrötter: Ztschr. f. klin. Med., 1907, lxii, 508.

success in diagnosing clinically primary lung carcinoma by bronchoscopic examination has already been noted.

3. *Thoracotomy.* — An exploratory thoracotomy ought to have the same diagnostic value as an exploratory laparotomy. Among the cases in which thoracotomy has been done may be mentioned several of those in Müser's[15] series, the case of Martens,[18] who reports a *Probeinzision* under local anesthesia in a case of advanced lung carcinoma, and one of Lawrason Brown's,[19] who describes a case in which thoracotomy revealed mediastinal sarcoma where mediastinal abscess had been suspected. Adler[1] urges exploratory thoracotomy quite emphatically. With the advance of local anesthesia and thoracic surgery this diagnostic procedure ought to be looked on more favorably and be unhesitatingly used whenever indicated.

TREATMENT

Early recognition and complete extirpation of the cancer offer the only hope of permanent cure in this desperate disease. Until very recently there really was no curative treatment for these most unfortunate patients, but since the rapid development of intrathoracic surgery the operative removal of an entire lung or a portion of it has become feasible. In addition to the lung resections reported by Ders, Lenhartz, Küttner and Sauerbruch, quoted by Weller,[7] there are on record still a few more. Müller[20] resected the right upper lobe of a 3-year-old child for suspected malignancy. He declares that a circumscribed tumor recognized early should by all means be removed. Kümmell[21] removed the entire right lung in a case of lung cancer presumably originating in the bronchial glands. As a preliminary to the operative surgery of the thoracic cavity he advises the production of artificial pneumothorax. Friedrich[22] reports the resection of entire lobes for the cure of pulmonary tuberculosis. Willy Meyer[23] states that sixteen cases of pneumonectomy for bronchiectasis have been reported until now. It must be admitted that resection of the lung is a rather difficult technical procedure, but if the operative difficulties can be overcome in the individual case, a successful outcome is to be expected. Much of the lung substance may be removed without disturbing the respiratory function, for according to the recent experimental investigations of Bernard and Mantoux[24] this function can be carried on with the lung capacity reduced to as low as one-sixth of its normal volume. Therefore, in the present state of intrathoracic surgery, no operable case of primary lung carcinoma should be allowed to go on to inevitable death when by operative interference it may be possible to clean out the neoplastic tissue and thus effect a permanent cure.

Radium, thorium and mesothorium are now being tried out in the treatment of malignant disease. Marked success seems to be attained in some instances; in others the results seem to be complete failures. In superficial cancers they often seem to be absolutely curative, but in deep-seated lesions they do not yet seem to do much good. In one of Müser's[15] cases and in Marschik's[12] case these emanations were tried, but in neither case did they do any good. Schittenhelm and Betz[25] believe that with their newly introduced "deep" technic these agents may become more beneficial in the treatment of internal diseases. The general opinion at present is that it is too early as yet to pass final judgment on the value of these new powerful physical agents. Should they be found by further experience capable of producing the beneficial results that are hoped for, the use of these radio-active emanations in the treatment of this condition will follow as a matter of course. In the present state of our knowledge the question whether or not to use them in a case must be decided by a consideration of all the aspects of that particular case.

CONCLUSIONS

1. It must be emphasized that primary carcinoma of the lung as a distinct pathologic and clinical entity is by no means as rare as it is generally thought to be.

2. The group of symptoms that should be regarded with suspicion are progressive dyspnea, persistent cough, hemoptysis, pain, weakness and loss of weight, and pressure or metastatic effects.

3. Signs of solidification of the lung, the presence of hemorrhagic pleural effusion, tachycardia without fever, and the absence of tubercle bacilli in the sputum are the significant objective findings.

4. A diagnosis based on these clinical phenomena may be established by the use of the Roentgen rays, the bronchoscope or thoracotomy.

5. Resection of the affected parts by radical operative procedure should be attempted in every operable case.

6. Radio-active emanations may prove to be of therapeutic value and, if possible, can be given a thorough trial whether surgery is resorted to or not.

Physicians Defense Building.

18. Martens: Jahresb. f. Chir., 1911, p. 311.
19. Brown: Bull. Johns Hopkins Hosp., 1914, xxv, 112.
20. Müller: Jahresb. f. Chir., 1911, p. 320.
21. Kümmell: Jahresb. f. Chir., 1911, p. 320.
22. Friedrich: Jahresb. f. Chir., 1911, p. 323.
23. Meyer, Willy: Ann. Surg., 1914, lx, 7.
24. Bernard, Le Play, A., and Mantoux, C.: Capacité pulmonaire minima compatible avec la vie, referred to in The Smallest Lung Capacity Compatible with Life, editorial, THE JOURNAL A. M. A., June 7, 1913, p. 1794.
25. Schittenhelm and Betz: Deutsch. med. Wchnschr., 1914, xl, 1147.

THE USE AND ABUSE OF THE TONSILS*

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It is with no small degree of tremulous fear and daring courage that I stand before so critical and representative an audience in an attempt to defend a helpless organ, whose guilt has been so uniformly acknowledged—an organ which has been accused of being an accessory to the fact in causing so many and varied pathologic conditions, of more or less serious nature, and which has, through professional and lay expressions, and even through the public press, been condemned without a full and impartial hearing. A sparkling hope that the innocent may be prevented from suffering with or for the guilty, that in the future, many tonsils may be rescued from unnecessary and undeserved slaughter, makes me feel privileged to present some relevant facts, which, alone, make true science. This hope is augmented by the successful escape from a somewhat similar series of indiscriminate massacres of the ovary, the appendix, the inferior turbinates, etc.

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There is not a fraction of a doubt that the removal of the tonsils is ofttimes indicated, and that innumerable good and commendable results have been accomplished by such surgical treatment. It is not, therefore, my object to attempt either to condemn or to revolutionize modern tonsil surgery in general, or to ridicule the professional attitude toward such procedure, but rather to endeavor to crystallize the views of both radical and conservative internists into such a form as will aid each of us in solving this complex problem. Probably no other instance exists in which so many human lives are involved by such a solution. In 1912, there were in Philadelphia 37,000 recommendations to parents made by medical inspectors that these organs receive immediate attention, constituting about 26 per cent. of the recommendations for all defects in that period. In New York City, during the same year, medical inspectors had supervision of 825,000 schoolchildren, and reported that approximately 30 per cent. of the children examined had hypertrophied tonsils. As it was the desire of the department to fix a certain standard as to when operation should be recommended, a letter was sent to a number of eminent specialists in nose and throat diseases asking them what, in their opinions, were the exact indications for the operative treatment of enlarged tonsils, and it is a very significant fact that no two of these specialists agreed as to the exact details. The question therefore involves the disposition of the tonsils in millions of children throughout the United States, and should be sufficiently vital to demand most exacting consideration.

PROTECTIVE FUNCTIONS

It is a universally accepted scientific fact that every organ is of essential value and service to the organism which contains it, and the organ under discussion has not yet been proved to be valueless. The faucial tonsil is a natural organ; some questions pertaining to its physiology have been definitely settled; judgment on others is so uniform as almost to force conviction, and some remain yet to be solved. From their important anatomic position, the ensemble of adenoid bodies—more commonly known as the Waldeyer ring—situated at the very entrance of the respiratory and digestive passages, would be looked on as constituting the first line of defense against microbic invasion, and of this group, the tonsils stand out most prominently. Primarily, it is the function of all lymphatic glands to act as a sort of filter for lymph. Thus, should the lymph contain any foreign substances or toxic material, these tend to be halted within the gland, not alone because of the anatomic peculiarities of the structure, but also on account of the cellular hyperplasia resulting from the irritation. This so-called barrier action is a most important one and the tonsils are arranged like sentinels to guard the most vital orifices of the human organism—a function that has been most clearly demonstrated by Bizzozero, Ruffer, Ribbert and others. Particles of dust, cells from malignant tumors, dead or disintegrating cells, red blood-corpuscles, bacteria, etc., which, in any manner, get into the lymph-vessels, are harmlessly carried along until a lymph-node is reached, where they are, in part at least, deposited among the trabeculae of the sinuses, or are taken up by the phagocytic cells, while the filtered lymph passes on and out of the efferent vessels.

This most important physiologic function has been attributed to the tonsils by Delafield, Pruden and many others. Stöhr has demonstrated that the tonsils are actually traversed by an enormous number of leukocytes, which exercise a kind of migration toward the oral cavity; actually demonstrating the passage of leukocytes through the tonsillar epithelium into the buccal cavity, which is a medium for various micro-organisms. This continual and normal condition is often termed Stöhr's phenomenon. Likewise, Metchnikoff found that when he removed a particle of mucus from the surface of the tonsils of a person in good health, he always could demonstrate that it contained numerous leukocytes, especially small phagocytes, filled with micro-organisms of all kinds. Gulland, Kümmel and Lindt have also demonstrated the presence of these leukocytes. Phillip Stöhr states that the leukocytes that wander through the epithelium of the tonsils are so numerous that they may be regarded as the most fertile source of the salivary corpuscles. Von Chiari agrees in this opinion and thinks that the tonsils serve for the purpose of the formation of leukocytes. Adami and Nicholls, as a result of careful investigations, concluded that while the tonsils are themselves, to a limited degree, phagocytic through their lymphoid cells, polymorphonuclear leukocytes in considerable numbers make their way from the blood-vessels to the surface of the tonsils, through their epithelial lining. These leukocytes are strongly phagocytic and their marked activity suggests that the tonsils form one of the most powerful barriers of the body against invasion by infectious micro-organisms.

Brieger has proved that the lymphocytes in the tonsils, though devoid of ameboid movement, enter the epithelium of their own accord, and he has demonstrated their presence in lesser or greater degree in the epithelium of the tonsils. We have to assume a vehicle which carries the lymphocytes from the adenoid tissue; this vehicle is the lymphatic juice which fills all the crevices between the tissue, and which reaches the surface through the finest canals. The cause of the movement of the lymphatic current, according to Brieger and Goerke, is to be found in a difference of pressure in the afferent lymph-vessels and the free surface. Increase of blood-pressure increases the force of the lymphatic current and carries along a larger amount of lymphocytes to the surface of the tonsils. In addition to the specific effect attributed to these lymphocytes, the current, *per se*, militates against the entrance of germs, as the mechanical effect of the current, assisted by the lymphocytes, washes away the infectious micro-organisms.

Harrison Allen, Kayser, Pluder, Schoenemann, George B. Wood, Ashby and others state that the tonsils undoubtedly form lymphocytes in the germinating follicles. Retterer also proved the existence of clear germinating centers in the follicles of the tonsils, and demonstrated the presence of lymphatic vessels occupying the entire follicular mass of organs, forming a system of closed lymphatic canals which do not open into the connective tissue reticulum by stomata or by their extremities. Piersol found that the epithelium covering the folds and the depressions of the tonsillar surfaces is completely infiltrated with lymphoid cells, and that great numbers of the cells escape into the oral cavity to become the salivary corpuscles, of which the tonsils are a most important source.

J. Gordon Wilson states that plasma-cells are derived from these lymphocytes, and are engaged in removing and utilizing cell material which has broken down, and that their presence, instead of indicating

disease, proves that the tonsils are physiologically active. D. J. Davis concurs in this view of the origin of plasma-cells, although Unna thought that they were derived from the connective tissue.

Hugh T. Ashby, in an analysis of three thousand cases of enlarged tonsils (and adenoids) concluded that they enlarge in order physiologically to augment the lymphoid tissues of the body. In every fetus, after the age of 6 months, it was possible to detect some adenoid tissue, but in infancy and early childhood, the lymphatic structures were at their maximum—exactly at a time when enlarged tonsils (and adenoids) are very common. I have presented sufficient evidence, therefore, that the tonsils are generators of lymphocytes and leukocytes, which are undoubtedly present in large numbers, where they may even be stored up for ready action, when called on, and that in addition to their specific bactericidal action, a constant stream of lymph from the depth to the surface exists, which alone would protect by counteracting an invasion of micro-organisms and by clearing the surface of these undesirable settlers. This may be termed the protective function of the tonsils.

DEFENSE AGAINST ABSORPTION

In addition to actually opposing the systemic invasion with infectious micro-organisms by this protective action of the cellular elements, it has been conclusively proved that the tonsils, *per se*, actually antagonize the entrance to their interior of infectious germs. Hodenphyl conducted a careful series of experiments dealing with the phenomena of absorption at the level of the tonsils and found that the epithelium prevented absorption, which latter became possible only when the epithelium was destroyed, or when the substances employed were introduced under the epithelial bed, and that even under these conditions, it was extremely slow. He employed fatty substances, powders and colored solutions as recommended by Labbé and Sirugue. He found that the epithelium had the same protective rôle at the level of the tonsils as at the level of the buccal mucosa, and that the crypts augmented its extent.

Even in the normal state, the epithelium is more or less irritated, and above all, at the bottom of the crypts, where Labbé and Sirugue have observed the incessant phenomena of cellular renovation. This epithelial irritation is due to the presence of dust, or small foreign bodies, which penetrate into the crypts; it is due above all to the existence at the surface of the tonsil of pathogenic microbes, which are found incessantly in the normal state. These micro-organisms, although in the crypts, are nevertheless on the exterior of the tonsil, and it is the defensive reaction of the epithelium which prevents their penetration. It is only when the epithelium is destroyed that they penetrate, and even in such instances, they rarely pass beyond the epithelial bed.

The leukocytes have not solely a phagocytic rôle in regard to microbes, but they destroy also their toxins by producing antitoxins, nucleins and oxydases, which have positive chemotoxic properties in regard to white corpuscles, and exalt their vitality.

The phenomena of absorption at the level of the tonsils have been further studied experimentally in the laboratory of Landouzy, at the Laennec Hospital, by Marcel Labbé and C. Levi-Sirugue. They found that the epithelium prevents absorption, and their findings were in full accord with those of Hodenphyl.

Jonathan Wright, in a personal communication (to Wendell C. Phillips) writes:

> My experiments seem to furnish conclusive evidence that under normal conditions, bacteria do not penetrate the epithelial layer of the tonsil in sufficient numbers at least to set up disease. Yet, we know from clinical experience that nerve shock from fractures, hemorrhage, nasal operations, uric acid, sudden cold, etc., produces systemic changes whereby infection is more easy and more dangerous. I believe that the mechanism causing surface infection is a chemicophysical change set up by impulses carried along the sympathetic nerves. This produces an alteration in the surface tension existing normally between the bacterial denizen of the tonsillar crypt and the epithelium which lines it. By virtue of this change, the living pathogenic agent enters the system.

Wright contends that the selective action of the tonsillar epithelium on dust and bacteria, whereby the latter at times are prevented from passing, and at other times are allowed to pass freely into the lymph-channels, is not fully explainable by the laws of immunity, but rather that we are dealing with living matter which obeys the laws of heredity and evolution, and that adaptation by natural selection is the only tenable explanation as to why the protoplasm of the epithelial cells of the tonsillar crypts acts in such a manner.

Clinically, we know that infectious germs, especially streptococci, are commonly found in the tonsillar crypts of healthy individuals, and that autoinfection is probably essential to induce follicular tonsillitis. Wright also adds the significant comment that it is a highly interesting sequence of events which takes place between the time the micro-organism floats on food or in the air into the tonsillar crypts and the time it reaches the deep lymphatics which drain the tonsil—which he regards as a biologic process of a physicochemical nature, affecting the surface tension of the colloids, of which the cells and bacteria are composed.

The defense of the tonsil against absorption, which has been so conclusively demonstrated experimentally, has been exhibited clinically by most observers, notably Jacobi, Fränkel, Goerke and others, who attributed the general mildness and low mortality-rate of tonsillar, as compared with other diphtherias, before the days of antitoxin, to this specific defense. It is simply remarkable how many and varied pathologic conditions are found by pathologists to exist, strictly confined to the tonsil, that are not found elsewhere by the internist—again adding clinical evidence of the defensive action of these organs.

OTHER FUNCTIONS OF THE TONSILS

Internal Secretion.—Escat believes that the faucial tonsils have not for their only functions those above enumerated, but that they also possess a physiologic and biologic function, due to an internal secretion. With Allen, he agrees that the tonsils secrete a principle, the exact nature of which it has been difficult to determine, but which may be useful in the development and to the growth of the individual, and probably to the growth of the skeleton. Masini believes also that the tonsils are the seat of an internal secretion, somewhat similar to that of the suprarenal gland, and he succeeded in producing an increase in the arterial pressure by injecting many animals with an extract of tonsils. E. L. Shurley subscribes to the presence of this internal secretion. Leto discovered fuchsinophil cells in the human tonsils, a similar to those which Schridde found in the thymus gland. He states that

their origin is not known, but they may develop from the perivascular tissue, and in his opinion, they have a secretive function.

Lubricant.—Frank E. Miller emphasizes the importance of the value of the tonsils as a lubricant. The frequency with which atrophic pharyngitis follows tonsillectomy adds clinical evidence relative to the necessity of this function, and John H. Johnson further endorses this point of view.

Voice.—That the tonsils possess important mechanical, acoustic and phonetic functions very few will deny. Their consistence, shape, size and presence or absence give structural variation to the resonance cavities, and create as well as determine differences in individual timbers of the voice. They play an important rôle in tone formation, and the excellent work of Faulkner along these lines is invaluable. J. Price Brown and many others have reported a large number of cases in which the singing voice had been practically destroyed by tonsillectomy.

Immunity.—Digby asserts that by a process of continual autovaccination, the tonsils (in common with the solitary follicles of the intestine, Peyer's patches and the vermiform appendix) protect the body against chance infection. By chemotaxis, all bacteria in the vicinity are attracted through the overlying epithelium into the lymph-nodule. This bacterial attack, invited into the region most favorable to the defensive mechanisms of the body, is nearly always repulsed; lymphocytosis takes place and a great excess of specific bateriolysins and antitoxins are also produced, which enter the general system and combat the attack at a more vulnerable point. Thus, immunity against disease is acquired without the individual having apparently had the disease. The same theory is advanced by Packard, who holds that the micro-organisms of acute inflammatory rheumatism are streptococci weakened through this action of the tonsils, and that otherwise we would observe septic diseases oftener. Mackenzie also endorses the existence of this function.

REMOVAL OF THE TONSILS

It is not within the province of this paper, nor will the time allotted permit me to enter into a discussion of the tonsils in their relationship to other diseases. The quartet comprising tonsillitis, rheumatic fever, endocarditis and chorea is almost classic. In addition, competent observers have considered the tonsils as a focus from which may be disseminated tuberculosis, diphtheria, empyema of the nasal sinuses, septic joints, gall-bladder disease, appendicitis, gastric ulcer, urethritis, etc. But we also agree that the uterus, breast and stomach constitute the organs which become the seat of the vast majority of malignant growths which produce metastases, and yet no one has had the courage to suggest wholesale removal of any of them as a prophylactic measure. Furthermore, we must not lose sight of the fact that the removal of the tonsils is not so simple a matter as is commonly supposed. Although a large number of deaths, complications and sequelae never reach the medical press, very recent literature from the pens of skilled and experienced specialists gives evidence of many deaths and complications resulting from serious hemorrhages, local traumatic disturbances, gangrene, diphtheria from auto-infection, infection of the middle ear, surgical shock, asphyxia, hyperpyrexia, general septicemia, surgical emphysema, pulmonary infarct, septic infection of the lungs and its serous membranes and also of the cervical glands, latent tuberculosis in the lungs and adjacent glands, status lymphaticus, serious disturbances of the nervous system, amygdalotomy rash, etc.

With these various well-confirmed expressions before us, who can conscientiously refuse to enter a most energetic protest against operative intemperance, and to place himself on record as considering the indiscriminate removal of the normal tonsil an absolutely inadmissible proceeding? We cannot and must not be guided by any rule of thumb, but must carefully study and consider each case as an individual entity. Very few will dispute the propriety of tonsillectomy: (1) when these organs greatly interfere with respiration and thus lead to insufficient oxygenation of the blood; (2) when they are actually diseased beyond repair, or (3) when there is no reasonable doubt as to their being, directly or indirectly, an etiologic factor in the production of disease. But the size of the tonsil is by no means a pathologic symptom; a small tonsil may prove more harmful than a large one, and yet size is frequently considered one of the chief indications, if not the chief indication for removal. The Bureau of Child Hygiene, in New York, has established the following very practical standard as a guide to its medical inspectors, namely, that no case was to be considered a true hypertrophy of the tonsils, unless the hypertrophy was such as to interfere with the nutrition of the child, or to cause secondary disturbances, interfering with its health, and incidentally with its school progress.

In conclusion, it is my firm belief that the tonsils were put into the throat of man with good, and not evil intent, to serve a physiologic rather than a pathologic purpose, and that the normal tonsils have physiologic, chemical and phonetic functions which should not be indiscriminately eradicated.

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ABSTRACT OF DISCUSSION

DR. JOHN ZAHORSKY, St. Louis: The tonsils are necessary, not only for the production of immunity to the child, but for protection to the air-passages. Removing tonsils for repeated attacks of tonsillitis, is often followed by recurrent attacks of bronchitis. The tonsil protects the air-passages, not perfectly but in a large measure. I do not advise the removal of tonsils before the child is 10 or 12 years of age, unless there are definite pathologic signs for their removal. I even go so far as to say no tonsil should be removed without a consultation of the pediatrist and the nose and throat specialist. I think adenoids protect the middle ear instead of causing middle-ear trouble. Unless they are so large that they interfere with respirations I would not advise their removal. We get middle-ear disease when the adenoids or tonsils are defective or when they are so large that they obstruct. When adenoids obstruct the postnasal space, they should be removed, but some tissue should be left as a protection.

DR. THOMAS S. SOUTHWORTH, New York: This paper is an indication of the fact that time is training us on this question of the "slaughter" of tonsils. In my experience in the dispensary in New York, more than half the cases sent in from the schools with the statement that the tonsils needed removal, were sent back because there was no good reason for their removal. One thing in Dr. Comroe's paper I will comment on. There is a great deal in literature referring to the tonsillar structures as a ring of lymph tissue which is the first line of defense of the pharynx. It reads in many cases as though this comparatively small area was in some way able to reach out for bacteria as they pass down the throat and seize and destroy them. The tonsil itself seems very vulnerable to disease. If the tonsil has any defensive

power it is through some form of internal secretion. If it acts as a sentinel a hypertrophied tonsil would be infinitely more valuable because it would present a much greater area for defense.

DR. J. H. COMROE, York, Pa.: The chief reason I was so desirous of presenting the tonsil question before this Section, as Dr. Zahorsky has hinted, was to stimulate better teamwork among the general practitioners, pediatrists and laryngologists. I have heard it frequently stated by nose and throat specialists that they themselves wished for this; that they ofttimes were compelled to carry out the specific instructions of the family physician against their own better judgment. Conversely, these same specialists have urgently advised the immediate removal of the tonsils when either the general practitioner or the pediatrist recommended noninterference. There is no absolute standard as to what constitutes a "normal tonsil." Each case must be considered as an individual entity. It is my belief that the tonsil is spoken of as the direct etiologic factor in systemic disease in too many instances. If I can drive just one point home, especially among general practitioners, namely, that the tonsil should be studied more carefully in relation to each patient, and that its removal should never be indiscriminately considered, I will feel that I have accomplished my chief purpose.

THE RELATION OF HEAT TO THE MORBIDITY AND MORTALITY OF INFANTS FROM GASTRO-INTESTINAL DISEASES*

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During the summer of 1912 we began a study of the influence of climatic conditions, particularly of heat, on the health of infants. In this study a certain number of babies that were coming to the infant-welfare stations of Chicago were observed for a prolonged period of time, by daily visits in their homes. Maximum and minimum thermometers were installed in the babies' rooms. These were read daily, the infants' temperatures taken, notes were made regarding the babies' general condition, the number of passages in twenty-four hours, and of the general hygienic condition of the homes. In thirty of these homes record was also kept of the humidity. The summer of 1912 was relatively cool, and inasmuch as the results of our observations were inconclusive with regard to any direct influence of heat on the well-being of the infant, it was thought that a renewed study in a more severe summer might give different results.

The work was therefore continued during the summer of 1913. Forty-six cases were studied, the observation of the majority extending over a period of about two months.

As to what should constitute a gastro-intestinal disorder we arbitrarily accepted four or more loose passages in twenty-four hours. All told, gastro-intestinal disorders were observed thirty-nine times in twenty-nine different infants; seventeen infants passed through the entire period without any disturbance whatsoever.

It is impossible here to give a detailed discussion of all of the observations; so the results will be briefly reviewed.

* From the Otho S. A. Sprague Memorial Institute Laboratory of the Children's Memorial Hospital.

* Read before the Section on Diseases of Children at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

I. ROOM TEMPERATURE IN RELATION TO TEMPERATURE OF INFANTS WITH GASTRO-INTESTINAL DISORDERS

In the 46 cases studied, 17 infants had no gastro-intestinal disturbance whatsoever, 20 had a single attack, 8 had two attacks, and 1 had three attacks. A tabulation of these disturbances (Table 1) with the infant's temperature and the room temperature on the day preceding and the day of the onset shows that in 14 out of the 39 instances, on the day of or the day preceding the attack, the infant's temperature was 100 F. or over, and in four instances it ranged between 99.5 and 100. Of the 18 infants that showed hyperthermia the room temperature was 90 F. or above in 12 instances and below 90 in 6.

TABLE 2.—INFANTS' TEMPERATURE IN RELATION TO MAXI-INFANT TO ONSET OF DIARRHEA

No.	Age in Months	Date of Onset	Child's Temp., F. Day Previous	Child's Temp., F. Day of Onset	Max. Room Temp., F. Day Previous	Max. Room Temp., F. Day of Onset	Remarks
1	2½	July 30	99	98	84	95	.....
2	3	July 11	99	98	78	73	.....
3	3	July 26	99	98.6	76	82	.....
4	3	July 14	100	104.2	84	93	Died July 22. No care
5	6	July 28	100	98	86	89	Died July 31. Atrophy. Death in 24 hours.
6	8	July 24	100.4	99.4	84	83	.....
7	4	July 29	99.6	100	94	88	Died July 30
8	7	July 5	98.8	99.2	100	96	Died July 20. No care
9	10	July 23	99.4	99.2	98	96	.....
10	10	Aug. 6	99.4	99	100	102	.....
11	5	Aug. 7	98.6	100	82	78	.....
12	3	July 19	99	98.6	84	84	.....
13	3	June 28	..	98	..	93	Died July 14. No care. Overfed by Father.
14	3½	July 26	97	97	84	78	Died July 31. Ac. Intox. in atrophy
15	9½	July 29	99	99.2	92	92	.....
16	5½	Aug. 2	99	99	88	86	Careless mother
17	9	Aug. 16	99	99.6	84	94	.....
18	9	Aug. 4	98.6	99.4	95	96	31 in 48 over 90 F.
19		Aug. 25	99.4	99.6	84	88	.....
20	10	July 9	99.8	100	100	96	Careless mother gave melon
21	5	July 31	100	100.2	84	85	.....
22	8	July 19	99	99	76	82	.....
23		July 31	100	100	90	88	.....
24	4	July 7	99	99	94	90	.....
25	4	Aug. 25	98	101	89	92	36 in 46 over 90 F.
26	6	July 11	99.2	98	91	75	.. ..
27	8	Aug. 10	99.6	98	89	91	.....
28		Aug. 23	97.1	97	84	71	.....
29	7	July 1	..	98.6	..	88	Loose movements for 2 months
30	12	Aug. 20	98.6	98.4	89	90	.....
31	10½	Aug. 9	98.8	99.8	84	92	.....
32		Aug. 20	98.6	100.2	92	82	.....
33	6½	July 21	99.6	100.2	82	85	22 in 42 over 90 F.
34		Aug. 11	100	98.8	101	94	.....
35	8	July 7	99	..	..	90	34 in 42 over 90 F.
36		Aug. 2	98	100	98	94	.....
37	6	July 9	98.4	99.2	108	98	43 in 44 over 90 F.
38		July 21	99.4	99	96	110	37 in 44 over 95 F.
39		Aug. 8	100	100	100	108	.....

Of the 21 cases that had no fever at onset the room temperature was 90 or above in 13 instances and below 90 in 8, showing that the proportionate number of instances in which the room temperature was above 90 F. was just about the same in those cases with fever as in those without.

Of those cases in which the room temperature did not go above 90 F. 5 infants had a temperature of 100 or more, 1 infant had a temperature of 99.6 and 8 infants had no temperature above normal.

As in the preceding, this summary shows no definite relation of high room temperature to infant hyperthermia and gastro-intestinal disturbance. The aver

age room temperature of the day before and the day of the onset of the dyspepsia was 89 F., in both instances. As seen from Table 1, the room temperature varied from 73 to 110 F., and with temperatures as high as seen in Table 1, it would seem likely that the room temperature on the day of the onset was responsible for the gastro-intestinal upset;

TABLE 2.—INFANTS, TEMPERATURE IN RELATION TO MAXIMUM AND MINIMUM ROOM TEMPERATURES

Case	Infants' Temperature: 100 to 101	Infants' Temperature: 101+ F.	Maximum: 90+ F.	Maximum: 86 to 90 F.	Maximum: 85 F.	Minimum: 80+ F.	Minimum: 76 to 80 F.	Minimum: 75 F.
1	3	..	..	..	3	..	3	..
2	3	1	..	3	1	1	..	3
3	4	..	..	..	4	..	..	4
6	1	2	..	1	..	1	..	..
8	3	..	4	1	..	..	2	3
9	1	1	..	1	1	..	..	2
10	1	2	3	..	..	..	1	2
11	2	..	1	..	..	1	..	1
12	2	1	1	2	..	..	1	2
14	1	..	..	0	1	..	..	1
15	4	..	..	1	3	1	2	1
21	..	1	..	..	1	..	..	1
23	2	1	2	1	..	1	1	1
24	1	..	1	..	..	..	..	1
25	4	..	3	..	1	..	..	4
26	3	1	3	..	1	..	3	1
27	2	..	1	1	..	..	..	2
28	3	..	..	1	2	..	..	3
29	1	2	1	..	2	..	..	3
31	..	4	3	1	..	1	..	3
32	..	1	1	..	..	..	..	1
33	1	..	..	..	1	..	..	1
37	1	..	..	..	1	..	..	1
38	2	..	1	..	1	1	..	1
41	1	..	..	..	1	..	..	1
42	1	..	..	..	1	..	..	1
43	1	2	..	..	3	..	..	3
44	3	..	2	..	1	1	..	2
45	2	..	2	..	..	2	..	..
46	3	1	4	..	..	2	..	2
Total	55	20	33	13	29	12	14	49

over against these figures, however, must be set the total number of times in each case that the maximum room temperature exceeded 90 F. without any hyperthermia. For instance, in Cases 18, 25, 33, 35 and 37, in which of a total of 222 maximum room temperature readings, 156 showed a maximum room temperature above 90 F., the infant had no fever.

With reference to the incidence of dypepsia it is seen by examination of the dates of onset that there is a fairly even distribution of the cases throughout the summer, with a slight bunching of the cases during the hot spell at the end of July (six cases in four days) and a similar grouping (six cases in five days) early in July, just during and after a drop of 25 degrees in the outdoor temperature. Carelessness on the part of the mother was charted in five cases.

II. FEVER IN THE INFANT IN RELATION TO HIGH MAXIMUM AND MINIMUM ROOM TEMPERATURES

Leaving out of consideration those cases of fever associated with diarrhea, there remain seventy-five instances in which the infant's temperature rose to 100 F. or above.

A summary of this series as given in Table 2 shows that the maximum temperature was 90 or over in 33 instances, between 85 and 90 in 13 and below 85 in 29 instances.

The minimum temperature was 80 or over in 12 instances, between 75 and 80 in 14 and below 75 in 49 instances.

Here again it is evident that there is no constant relationship between fever in the infant and high room temperature.

III. HIGH MAXIMUM ROOM TEMPERATURE IN RELATION TO HYPERTHERMIA IN THE INFANT

The analysis of the cases from this point of view is to serve as a further control on the relationship of heat to the incidence of dyspepsia, as well as on the relationship of fever to high room temperature. One hundred room temperatures over 95 F. were tabulated, as seen in Table 3. A summary of the tables is as follows:

Of the 100 maximum room temperatures, 46 were between 95 and 99; 44 between 100 and 104 and 10 above 105.

Of the 100 temperatures of the infant, 82 were between 98 and 99.5; 11 between 99.5 and 100 and 7 were over 100.

With room temperature higher than in any other series of cases there were only nineteen instances in which the infant's temperature was abnormal. In over 80 per cent. of the cases the infant, in spite of the high room temperature, could keep its body temperature within the normal range. Here again we see how well the infant can adjust itself to unfavorable circumstances.

TABLE 3.—HIGH MAXIMUM ROOM TEMPERATURES IN RELATION TO INFANTS' TEMPERATURES

Case	Temperature of Room F.: 95-99	Temperature of Room F.: 100-104	Temperature of Room F.: 105+	Temperature of Infant F.: 98-99.5	Temperature of Infant F.: 99.6-100	Temperature of Infant F.: 100+
1	4	..	..	4	..	..
2	3	1	..	4	..	..
3	1	..	..	2	..	..
7	1	..	..	1	..	..
8	12	..	..	7	1	4
9	1	..	..	1	..	..
10	..	1	..	1	..	..
11	..	6	..	3	2	1
14	..	1	..	1	..	..
15	..	3	1	3	1	..
17	1	3	..	4	..	..
18	1	..	..	1	..	..
19	2	..	..	2	..	..
20	1	..	..	1	..	..
22	2	..	..	2	..	..
23	..	3	..	1	1	1
24	..	2	2	2	2	..
25	..	2	2	3	1	..
26	..	4	..	4	..	..
27	2	..	..	1	1	..
28	1	..	..	1	..	..
29	2	..	..	2	..	..
30	2	1	..	3	..	..
31	2	2	..	2	1	1
32	..	3	..	3	..	..
34	2	1	..	3	..	..
36	2	..	..	2	..	..
38	3	..	..	3	..	..
39	1	..	..	1	..	..
41	2	..	..	2	..	..
44	1	3	..	3	1	..
45	..	2	1	3	..	..
46	..	2	3	5	..	..
	46	44	10	82	11	7

IV. THE RELATIONSHIP OF OUTDOOR (WEATHER BUREAU) TEMPERATURE TO ROOM TEMPERATURES

Here I want to call attention merely to the great differences which may exist between room and outdoor temperatures. As a rule, the room temperature reaches its maximum twenty-four hours after the outdoor maximum. In a selection of seventy-five instances of high maximum room temperatures the differences between indoor and outdoor maximum and minimum were as follows:

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The indoor exceeded the outdoor maximum by 10 34 times, by 20 35 times, by 30 5 times, by 40 1 time.

The indoor exceeded the outdoor minimum by 10 37 times, by 20 4 times.

These great differences in the indoor and outdoor temperatures are unquestionably maximal. I feel sure that, if we had the street or backyard shade temperatures to compare with the room temperatures, the differences would be very much smaller.

V. REPORT OF CASES RESULTING IN DEATH

CASE 1.—Baby K., aged 3 months. Condition fair. Slight dyspepsia at beginning of observation. Condition grew gradually worse. Mother would not give any care. Observed from July 11 to July 22, 1912.

CASE 2.—Baby C., aged 4 months. Weight 8 pounds. Atrophic infant. Severe cough. Dyspepsia began July 26. Grew worse to July 30. Intoxicated. Child died July 31. Observed from July 12 to 31. No maximum temperature over 92 F.; no minimum over 82 F.

CASE 3.—Baby F., aged 4 months, weight 8½ pounds. Did well up to within twenty-four hours of death. Died July 30, 1913. Body temperature 100. Maximum room temperature July 28, 94; July 29, 88.

CASE 4.—Baby P., aged 4 months. Weight 8½ pounds. Dyspepsia from beginning. From four to eight bowel-movements a day. Mother would not follow instructions. No special symptoms. Child gradually lost ground and died July 28, 1913.

CASE 5.—Baby J., aged 3½ months. Weight 5½ pounds. Began observations July 19, 1913. In fair condition. July 26, diarrhea began. Maximum temperature, 89 F. July 29, temperature from 98 to 88 F.; July 30, from 96 to 88. Child died July 31, 1913. Temperature July 28, 100 F.

CASE 6.—Baby W., aged 3 months. Weight 7⅛ pounds. Good condition. Mother very ignorant. Diarrhea at onset. June 28, 1913, fifteen stools. Gradually improved on slow increase in food. Father overfed child. Acute exacerbation and death July 14, 1913.

VI. ANALYSIS OF FATAL CASES

Four of the six deaths occurred between July 28 and 31, the period of greatest heat, the others on July 14 and 22. Of the six cases three must be ruled out because of unwillingness on the part of the mother to follow out instructions. Of these, Infant 1 received no care. The final note by the nurse "Mother seems happy" explains the case. The second, Infant 6, was just recovering from an acute dyspepsia and was still on a restricted diet, when its father decided that it was not getting enough food, with the result that it died the following day.

The third, Infant 4, had a dyspepsia at the beginning of July and continued about the same all through the month. The mother was never willing to follow out instructions. It was overfed most of the time.

Of the three remaining cases, Case 2 must be excluded because in all probability the gastro-intestinal disturbance was parenteral in nature, secondary to a respiratory infection.

This leaves us just two cases, Infants 3 and 5, both atrophic, the latter more markedly so (5½ pounds at 3 months). Infant 3 died within twenty-four hours of the onset of symptoms without any special signs. Temperature was up to 100 F. The maximum room temperatures were 88 the day previous and 94 the day before that, which was not at all excessive when compared with the other maximum temperatures.

In Case 4, the dyspepsia began on the twenty-eighth with the infant's temperature up to 100 and a maximum room temperature of 89. The two days following were very severe. The maximum and minimum room temperatures ranging from 98 to 88 F., and from 96 to 88 F. In this case alone one can see a possible direct relationship of heat to the death of the infant.

In these six cases the direct effect of heat could be responsible in only one or possibly two cases, and even in these there is a question as to the direct relationship of room temperature and infant death.

The factor of faulty diet, which is particularly harmful at this period, we have not mentioned because, in the great majority of our cases, it was carefully supervised and our instructions carried out except in cases which are especially noted.

In this paper it is my object merely to present the results of the last summer's work and in a future publication to go into a detailed report of the work during the past two years. In passing, I want to say that work of this kind has been done before on a small scale by Rietchel, Kleinschmidt, and others, who laid varying emphasis on the direct effect of heat on the child.

As a result of the summer's work the direct effect of heat alone must be considered as of relatively little importance. Infants can tolerate temperatures decidedly above those usually supposed to be harmful, without any bad effects, in fact, can gain in weight during such time.

Nothing is more striking than the difference in the amount of clothing that infants have on when coming to an infant-welfare station; on the first visit they are practically all overclothed, and even after repeated warnings the mothers insist on putting more clothes on their infants than is good for them. It becomes possible, therefore, to have an overheating of the infant with relatively low temperatures, provided that the clothing of the infant is wrong, and, in like manner, with high temperatures, it is almost sure to occur if the clothing of the infant is not properly adjusted. That clothing may act very intensely in producing fatal heat retention has been recently shown by experiments on animals in the Sprague Institute Laboratory of the Children's Hospital by Drs. McClure and Sauer.

There is no question that the summer heat increases the infant morbidity and mortality from gastro-intestinal disturbances. The efforts to explain this fact have been various. The explanations offered are based on the heat alone; or, on heat in conjunction with humidity. Another factor which has been emphasized has been faulty diet. In addition, more elusive factors like the general care of the baby have been taken into consideration. When a relatively large number of cases like the foregoing are studied, when the conditions with regard to heat, humidity and diet are rather uniform, and when in spite of this fact a certain number of infants show ill effects, even at relatively low temperatures, another factor must enter the field permitting of great individual variability. This factor we see in the clothing.

CONCLUSION

This study would indicate that it is a matter of improper adjustment of the individual to its surrounding temperature, rather than the height of the temperature that helps to swell the total of gastro-intestinal deaths during the summer. Our aim must be to educate the mothers to a realization that, as infants must be kept warm in the winter, so must they be kept cool in the summer.

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ABSTRACT OF DISCUSSION

Dr. L. T. Royster, Norfolk, Va.: Three years ago I undertook a study of this subject in twenty-six American cities. In no instance have I seen what I consider a proper amount of attention paid to humidity. A child can stand an intense amount of heat, provided there is a proper amount of radiation. In my investigations I found that children in the hottest climates, perhaps, and certainly in the hottest sections of this country, had comparatively little trouble of this kind when near the seashore. To show from a practical point of view what relation humidity has to this question of radiation, in spite of humidity, the children kept near the seashore in Norfolk rarely have trouble of this nature if sent before the first hot spell. When they do have trouble it is invariably following a land breeze, which is slight to start with and not cooling. The humidity and heat on the seashore may be the same, but the greater motion of the air from the almost constant breeze is greater and promotes radiation. Of course we have to take into consideration the question of home environment.

It is an estblished fact that the humidity varies in different parts of the same city. In my private practice I find that the children of the well-to-do do not begin to have the so-called summer diarrheas until several days later than the poorer children in the same community, which to my mind is due to the fact, as brought out by Dr. Helmholz' paper, that the temperature in the poorer houses is much higher than in those of the more well-to-do.

The question of clothing as a preventive measure is an important one. I am accustomed early in the hot season to send out notices to remind my patients to decrease the baby's clothing and covering in hot spells. One of our text-books says a child should wear high neck and long sleeves all summer. Most of my children would die if they did. I advise the mothers to take off all of the baby's clothing except the diaper during the heat of the day. I feel that this question of the relation of heat and humidity should be studied carefully.

Dr. R. M. Smith, Boston: Humidity is certainly a large factor in the causation of digestive disturbances in infants. In our experience in the Floating Hospital, the days with high humidity, whether or not the temperature is much elevated, bring many patients for admission. A word should be said about therapeutics in these cases. These children require little starvation. Favoring the radiation of heat from the body is much more important than the treatment of the digestive tract.

Dr. Charles Douglas, Detroit: No one can deny the effect of heat as well as humidity on these babies. For many years I have been in the habit of educating the parents in anticipation of the warm weather, to lessen the food and clothing when a hot day comes, or even a hot half-day. Where I live we have no sea air, but I try to bring about a simulation of the same condition by affording opportunities for evaporation. Small children and young babies should be stripped to but one garment in hot weather, and with very young babies I would even remove the napkin and place them on a pad.

We should teach the parents to ask themselves how they feel on a hot day, and what do they do to become comfortable, and then give the child the benefit of the same reasoning. Unfortunately the people look on the child as some different animal and give it most outrageous treatment. They sacrifice the babies through their extreme ignorance.

Dr. John Zahorsky, St. Louis: No doubt the mortality in the early part of the summer is increased. The important question is, Does the direct external application of heat produce diarrhea? Is it the direct effect of heat that produces so-called summer diarrhea? That has not been proved. In fact the proof is the other way. I am not convinced that heat produces summer diarrhea. A few weeks ago the temperature was 100 in St. Louis. We had no diarrhea as a result of it. At our Foundling's Home the temperature was 99 in the nursery, and we did not have a single case of diarrhea. I do not think the evidence is conclusive that heat, by its direct effect, causes diarrhea. Heat does produce a bad effect on a sick infant. This is especially true in the early part of July. The atrophic infant cannot resist the heat, but it dies from the illness it already had. Not that these prophylactic measures of keeping the baby comfortable should be neglected. I think in these diarrheas there is still another factor. That other factor must be searched out. As to humidity, that has been studied again and again. No one has been able to prove that humidity and summer diarrhea are directly connected. In order to study summer diarrhea properly, a series of cases should be reported with all attending circumstances. We should know the temperature and all the conditions, and hundreds of cases should be studied. We will never reach a solution by studying figures from our mortuary tables. I think some other factor is the cause of summer diarrhea.

Dr. W. W. Butterworth, New Orleans: The greatest mortality in New Orleans is in the early part of the summer. We lose most infants in April and May and the latter part of the summer. High death-rate seems to be associated with seasons when we have a wide variation in the mercury. We have warm days and cold nights, and the infant cannot adapt itself readily to the wide variation. The new-born has possibly four times the surface area per pound of body-weight that the adult has. With their immature nervous systems the new-born are not able to respond to these wide variations. Certainly the mere matter of temperature does not account for these conditions.

Dr. S. W. Burton, Albuquerque, N. M.: I am in a city of 20,000 people, and the number of cases of summer diarrhea are very few there. We have a wide variation of temperature between day and night. This condition can be overcome by keeping the child in the shade in the day time. Our cases of children's disease in the summer are much less than those of eastern cities.

Dr. T. C. McCleave, Berkeley, Cal.: To one from the West it is interesting to hear heat spoken of as causing this condition, with a temperature running in the 90's. In many sections of the West, where the temperature goes still higher, we have none of this trouble. A temperature in the 90's in some of these sections would be welcomed as a cool summer day. For weeks at a time the temperature in some sections ranges well above 100. In some places it reaches 110 or 115, and still we have none of this trouble; therefore it is clear that either the heat has no effect of itself in the production of these cases, or else that our heat has some different quality. The humidity in these hot sections is very low. It seems to me that this infant diarrhea is due, not to any single factor, but that the East must show a complex etiologic condition.

Dr. Henry Helmholz, Chicago: I am glad to hear Dr. Royster's remarks. It is important to emphasize the clothing as a factor. The important thing in these observations is on the negative side. All of these babies were constantly under the supervision of nurses. I wish we could enter the homes every day to see that the child is clothed as nearly in accord with the temperature as possible. Our temperatures are high and then low. You can see the difficulty of clothing these children when the daily variation is as high as 50 degrees, and that for a long period. If the child is clothed for 90, and then a few hours after that the temperature drops to 50 or even 40, you can see how readily these changes would affect the child. It is unquestionably harder for a child to lose heat on a humid day than on a dry day—all the more reason that the child be properly clothed for a hot, humid day. The custom Dr. Royster mentioned is one we tell our mothers to use for their babies. In answer to Dr. McCleave, I would say that where they have no summer diarrhea of course the temperature cannot play a rôle. We have a great deal of summer diarrhea in Chicago.

We must find out the factors producing it. It seems by controlling the hygienic condition of the child we can influence that markedly. It seems to me particular emphasis should be laid on the clothing.

THE INFLUENCE OF STARCH ON INFANT DIGESTION*

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No fact seems now to be more satisfactorily established in the physiology of infancy than that the starch transforming ferments of the saliva and pancreatic juice are actively present in very young infants, even at birth; and that such infants are therefore early capable of digesting moderate quantities of cooked starch.

Jacobi, in 1876, recommended the use of starch in the artificial feeding of infants from birth, and contended that it was utilized. This view was both confirmed and denied. Kerley and Campbell, in 1906, found by testing the stools for starch that twenty-three out of thirty infants showed a good starch capacity. In the same year Kerley, Mason, and Craig demonstrated the invariable presence of amylolytic ferment in 161 tests on the stools of twenty-six breast fed infants, of whom twenty-two were under two weeks old.

The latest important and conclusive work is that of Hess (1912), who aspirated with his duodenal catheter fluid from the duodenum of infants varying from a few hours to a year old. Amylase was found before new-born infants were put to the breast. During the first week of life the amount of pancreatic secretion thus obtained was very scanty, but contained the starch-splitting enzyme. Later there was both an increase of pancreatic secretion and a decided augmentation of amylolytic power. These findings seem to dispose permanently of the oft-repeated claims that starch has no place in the dietary of the first year, because of physiologic unpreparedness. In view of the known adaptability of the organism, it also seems reasonable to suppose that the starch-digesting function will develop more rapidly if stimulated by the administration of starchy food.

Until recently the ends attained by adding cereal, i. e., starchy decoctions to cows' milk feedings, have been presumed to be two-fold. Foremost stands the contention of Chapin that cereal diluents by their mucilaginous properties prevent mechanically the formation of large tough curds of casein, and render such coagula as are formed more permeable by the gastric juice. Second, though often very important, has been the view that the vegetable proteins of the grains thus added to the food serve to supplement the rather deficient absorption of the animal proteins of the milk in certain types of malnutrition.

While both of these facts seem well established, and have now long sufficed as explanations of the successful use of gruels as diluents in infant feeding, it would appear that they have another and probably more important field of action. This field is no longer exclusively that of the stomach and gastric digestion, but is transferred to the intestine, where the starch influences intestinal digestion, peristalsis, and absorption. The part played by these three functions in the normal nutrition of the infant cannot be minimized. Beside them, the functions of the gastric digestion may be said to take second rank, for the stomach is largely a receiving station, performing certain preliminary tasks. Comparatively little absorption takes place in the stomach, the greater part occurring in the intestine. Modern fluoroscopic examination of infants, after a fluid bismuth meal, has demonstrated what we have long suspected clinically, that the fluid contents of the stomach begin to pass the pylorus into the duodenum within a few minutes after ingestion. One of the chief duties of the stomach, therefore, is to retain behind the watchful pylorus all coarse masses of food, whether curds or other substances, which are not yet fitted for intestinal treatment, and to disintegrate them until they can properly be allowed to pass.

As already indicated, nutrition from the small intestine depends on the orderly conduct of its interlocking processes. Here the powerful and varied action of the hepatic, pancreatic, and intestinal secretions combine to split the food elements into their endproducts for absorption. Peristalsis slowly kneads and churns the chyme, so as to bring all portions into contact with the bowel wall for absorption, and also to mix its secretions with the mass. If peristalsis be hurried, or the intestinal mucosa be irritated, or denuded of its epithelium, the orderly processes are no longer followed and assimilation suffers. How, then, do such disturbances arise? Probably from two sources. First, from fermentation or other abnormal cleavage of the food elements in the stomach, which causes irritation when they are passed into the intestine. Again, either secondarily or primarily, from similar fermentation or abnormal cleavage during intestinal digestion.

We owe to Finkelstein the attention which has been directed to the effect of the fermentation of the carbohydrate sugars on the mucosa of the small intestine, and on intestinal peristalsis. His view is that the presence of sugars in excess, or the presence of the products of an abnormal fermentation of such sugars, especially of milk-sugar, irritates the mucosa, even at times causing partial denudation of its epithelium, and that both these and the increased peristalsis which they cause, hurry the contents through the bowel, not only causing loose movements or diarrhea, but also interfering with absorption and assimilation.

I would go further than Finkelstein in my belief that fats as well as sugars produce these untoward results.

Let us consider for a moment some of the historical and clinical evidence for accepting and extending Finkelstein's belief. Jacobi long ago called attention to the laxative effect of sugar. Also, certain types of diarrhea in infants with abundant frothy stools, acid reaction, and irritation of the buttocks, have been more or less generally associated with the sugar in the food, as well as with the fermentation of other carbohydrates in excess. In this connection, you will recall the use of molasses as a stimulating enema, and possibly some of you, in your earlier days, have been subjected to a personal spring housecleaning with the time-honored remedy of sulphur and molasses, under the delusion that the molasses played no more active part than that of an agreeable vehicle for the sulphur. You are doubtless conversant with the use of semi-fluid malt preparations as a laxative, when added to an infant's bottle or dietary.

When, however, Keller undertook to overcome the acidosis caused by a relative intolerance and malassimilation of the fat of cows' milk by the substitution for the hydrocarbon fats of approximately equal caloric values of the carbohydrates present in his "malt-soup extract," he promptly found that he could not give sufficient for his purpose without causing looseness of

* Read before the Section on Diseases of Children at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

the bowels. To prevent this, he was forced to employ in his mixture the starch of wheat-flour. In the usual process of preparing malt-soup, the wheat flour is cooked with the water and milk and thereby gelatinized. With the addition of this gelatinized starch, considerable quantities of the thick, semi-fluid preparations of maltose and dextrin can be given to young children without causing undue looseness of the bowels.

Again, when the use of so-called buttermilk began to be generally employed abroad for the feeding of infants suffering from fat intolerance, the preparation used was rarely straight buttermilk. The so-called buttermilk, which was almost universally employed, was a compound of ordinary buttermilk, or artificial fat-free buttermilk, boiled wheat, rice, or corn-flour, and cane sugar. The virtues of this mixture, which by the way, had at the time surprisingly little vogue in this country, in view of its wide use abroad, were generally ascribed to its low fat-content, and as I have elsewhere pointed out, were also undoubtedly due in part to the non-coagulability by rennet and acid of the already precipitated lactate of casein.

Teixeira de Mattos, in his original communication, states that the flour was added empirically to prevent the buttermilk curds from clumping together. He says also that the quantity of the flour is empirical, and, being small, that how much of it was retained in the infant's body was of minor importance. Even the sugar was added quite as much for taste as for food value. I think it certain that the starch was not expected to add materially to the caloric value of the mixture, for its assimilation in any considerable amount was not counted on. Did it, however, have an unsuspected action?

More recently, E. Schloss, in reporting his experience with "whey-modified milk" in infant feeding, found that infants under 3 months of age made better progress when the mixture was made with flour. On another hand, although Keller felt that his malt-soup was less adapted for very young infants, Israel-Rosenthal and Oerum have found that by reducing the amount of malt-soup extract recommended by Keller, but maintaining or even increasing the amount of flour, it was admirably borne by young infants under 3 months of age.

Further clinical evidence on the usefulness of starch has, in the meantime, steadily piled up in hospital and out-patient practice in this country. This has been due to the manifestly greater toleration of many marasmic infants, and of others with disturbed digestions, for feeding mixtures made up with a thin barley gruel as the diluent, as compared with mixtures made with plain water and lime-water. Indeed, it has become almost unconsciously the custom to use barley water or other cereal as a diluent in the stock formulae of many of the infants' hospitals and milk dispensaries.

Since no such element as starch is indicated by the composition of breast-milk, which has so largely figured as our model in feeding infants, is it not about time to again ask ourselves seriously why cereal additions in the form of boiled, and therefore gelatinized, starch should have crept almost as a necessity into the final composition of such diversified types of feeding as diluted cows' milk, fat-free buttermilk, whey-modified milk, and malt-soup mixture? Why should boiled starch be added to all of these? Certainly, the starch must play some part to account for its use. Is this part played similar in each diverse mixture? Chapin's theory of the influence of starch on the rennet coagulation of casein could not wholly account for it. Nor is it, primarily, to add caloric value; since, for example, that of the carbohydrates was already abundant in malt-soup.

It has always been characteristic of infant feeding to arrive at clinical results by empirical methods, and to find our scientific explanations later, even at the cost of upsetting carefully constructed theories. The experience with buttermilk, malt-soup, and even plain dilutions of cows' milk, pointed to the fact that when employed in disturbed conditions of the digestive tract they were better borne if gelatinized starch entered into their composition. From this, it would be a simple deduction that such boiled starch exerts some sort of protective action.

The next question which presents itself is whether this protective action is operative against the disturbing effects of one or more than one of the elements of our food mixtures or, of course, the products into which they may normally or abnormally be split during digestion. Keller's experience with the sugar of his malt-soup mixture seems to have clearly proved that boiled starch acts as a definite protection against the irritative effects of moderately large quantities of sugar. In further confirmation of this view may be cited the claim which I made recently, that dextrin, when present in large percentage, in maltose-dextrin preparations, exercises a similar protective action, and that this accounts in part for the relatively higher toleration of there saccharids as compared with cane-sugar and milk-sugar.

It will be recalled that dextrin, which is always present, though in different proportions, in all so-called "maltose" preparations, is closely allied to starch. It has many similar properties, being like starch, a poly-saccharid, a reversible protective colloid, and non-fermentable, and non-dialyzable. It is noteworthy that while the thick, semi-fluid, malt-preparations typified by malt-soup extract, have a low dextrin content of 10 to 15 per cent. and are laxative from their high content of maltose—requiring combination with boiled starch to overcome this drawback—on the other hand, such of the dry, powdered forms as contain a high percentage of dextrin—40 to 60 per cent.—have little or no laxative effect, and may, on the contrary, prove constipating.

Gelatinized starch also unquestionably acts as a protective against the undesirable effects of fat. This may be exerted on a high fat in breast milk—where the reduction of the fat cannot be readily accomplished—as well as in intolerance of the fat of cows' milk, where starch appears to have a curative action after the high fat has been reduced.

High fat in breast milk, during the early weeks of nursing, is one of the most prolific causes of gas, spitting-up, and loose mucoid stools with flaky curds. Many of these cases are the so-called "colicky" babies, whose mothers' milk is condemned as "poor" and the babies weaned, when with reasonable understanding of the condition and proper treatment they might readily continue at the breast. Such infants, already disturbed by the more readily digestible fat of breast milk, are not good subjects for the customary formulae of cows' milk commonly employed in bottle feeding, and weaning is liable to bring about a condition worse than the first. Complementary feedings, however, of some starchy gruel, are most useful in these nursing infants for overcoming the bad effects

of the high fat percentage, not only when given so as to dilute the breast milk, but occasionally also, as I have knowledge, when the gruel is given by itself only once or twice a day.

In view of the proven mitigating action of boiled starch on the disturbances caused by over-fat breast milk, it seems to be a reasonable deduction that the favorable effects and toleration of both malt-soup and buttermilk on infants previously disturbed by the fat of cows' milk, have been due not only to the reduced amounts of such fat as they contain, but also to the presence of the starch which affects favorably the previously irritated small intestine and prepares the way for a more orderly resumption of its functions.

This brings us to a consideration of the extended use of barley water and other cereal decoctions for marasmic infants and others suffering from varying grades of digestive disturbance. In these, intestinal disorder is usually attested by the stools, and it is logical that here also the use of a starchy decoction, even though coincident with the correction of some serious error, in the composition of the feeding mixture, should play a part in the improvement of digestive conditions. I am therefore of the opinion that the use of a cereal diluent for cows' milk, as advocated by Chapin, not only influences the curd-formation and stomachic digestion, but, further, may act as a prophylactic or curative agent for disturbances of intestinal digestion. This salutary action might, at times, be favored by the use of his dextrinized gruel, which substitutes dextrin for the starch, and the more readily absorbable maltose for other sugar.

However unnecessary and inapplicable the majority of the so-called infant foods may be for the continuous feeding of normal infants with undisturbed digestions, it must be admitted that some of them, when used intelligently, are useful for temporary employment in disturbances of digestion. It is probable that the success of some of these containing starch or dextrin, is chiefly referable to this factor.

There seems, however, to be more than one way in which the giving of starch may influence digestive processes, and, indeed, from analogy, one would expect the matter to be complex. Since the digestion of carbohydrates proceeds most favorably in an alkaline medium, starch and dextrin, which less readily undergo acid fermentation than some of the sugars, may readily be conceived as more favorable to the maintenance of alkalinity and carbohydrate digestion. The value of this hypothesis is enhanced by the conclusion of Roger and Simon that the amylolytic action of saliva (ptyalin), although inhibited by the acidity of the stomach, is reactivated by pancreatic secretion in an alkaline medium, such as normally obtains in the duodenum. This undoubtedly increases the amylolytic power of intestinal digestion beyond our former conceptions.

Furthermore, Holsti has shown that a preponderance of carbohydrates in the food excites a prompt and long-continued secretion of pancreatic juice, which is the opposite of what obtains with fats. Combe, of Lausanne, has emphasized the usefulness of a starchy diet in the prevention of intestinal putrefaction. In view of the demonstrated success of starch additions, which, as we have seen, were practically compulsory in several of the most popular forms of emergency feeding, it may fairly be asked whether the slow conversion of starch may not be one of the vital factors in its usefulness? The more complex the form of carbohydrate the slower it is converted or broken down for absorption, and therefore the less opportunity is afforded at any given moment for fermentation (Stolte). While the practice of giving all the carbohydrates in the form of sugar frequently results in overtaxing the upper part of the small intestine, a slower conversion, as of starch, spreads the process of absorption over a greater length of intestine. These differences cannot be without influence in instances in which intestinal digestion has been disturbed.

Lusk has demonstrated that dextrose, given to dogs, raises the surface temperature, increases the volume of the blood, and definitely stimulates metabolism. Whether the ultimate splitting of starch into two molecules of dextrose, when this proceeds in the normal leisurely way, under the influence of the body enzymes, has a more favorable effect on the metabolism of the infant, must remain for the present a matter of conjecture.

Taking the above views into consideration, it is readily seen that the rôle played by starch in the intestinal digestion of infants may be a diversified one. Nevertheless a survey of the growing use of starch in infant feeding, forces the conclusion that whether its action is simple or complex, this action is in a broad sense protective, in that it allows the consummation of desired results, which with the same food, but in the absence of starch, are not obtainable. It would therefore appear that not only is starch tolerated and digested when given in moderation in the dietary of infants, but that it should be recognized as having a distinct field of usefulness in proper'y selected cases.

In this attempt to seek some rational explanation of the wide-spread use of cooked starch in the artificial feeding of infants, let us not confuse, as is so commonly done, the infant with a normal digestion and the infant with a disturbed digestion. In my experience, starch, as a rule, is unnecessary for the former before the seventh or eighth month. In the latter, however, it is often a remedial factor of great value. No sensible person would deny that relatively excessive amounts of starch have caused and always may cause, of themselves, disturbances of digestion, but instances of such abuse do not preclude its judicious employment.

In conclusion I may say that while it is an established fact that even young infants are prepared to digest moderate quantities of boiled starch, the indication for its use appears to lie in those suffering from disturbances of digestion and nutrition. With these, the chief end subserved by such addition to their food is not solely to nourish the infant, but to promote nutrition by making possible a more orderly digestion and absorption of its main nutriment, milk. *

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* This paper was discussed with a paper by Drs. F. N. Talbot and Lewis W. Hill, entitled, The Metabolism of Carbohydrates with Special Reference to Its Effects on the Absorption of Fat and Nitrogen and on the Retention of Salts. The latter paper appeared in the American Journal of Diseases of Children for September, 1914. Both papers and the discussion will be found in the Transactions of the Section.

Science and National Progress.—Pasteur was right when one day, exasperated by the politicians who were running his beloved France to ruin, he exclaimed: "In our century science is the soul of the prosperity of nations and the living source of all progress. Uundoubtedly, the tiring daily discussions of politics seem to be our guide. Empty appearances! What really leads us forward are a few scientific discoveries and their application."—L. H. Baekeland, *Science*, Aug. 7, 1914.

PERCUSSION OF THE LUNGS

PART I. AN EFFORT TO STANDARDIZE THE DEGREES OF DULNESS

PART II. THE ADVANTAGES OVER THE OPPOSITE METHOD OF PERCUSSION FROM BASE TO APEX *

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BOSTON

PART I

While studying physical diagnosis as a student, one of the things difficult for me to understand was percussion. As I talk to students in the medical schools now, I am told by them that percussion is one of the hard things for them to learn and that it means the least to them of the physical signs. It has interested me to study why this is so, especially as I have come to regard percussion as a distinctly definite and valuable diagnostic means. This is so true that instead of correcting my dulness by what I learn from auscultation, as I once did, I now correct my auscultation by what I learn from percussion

My studies have led me to recognize that the standards of clinicians for the various degrees of dulness, 1-2-3-4-line dulness—meaning respectively, impaired resonance, definite dulness, very marked dulness and flatness—are so individual, so lax and so diversified that they amount to no standard at all; certainly not a standard that can be grasped by an intelligent student. It is a common occurrence for a physician to percuss a chest which shows nothing but 2- or 3-line dulness, and to have him call the 2-line dulness normal resonance, and in consequence, call the 3-line dulness only 1. In this way serious pathologic conditions are overlooked. The following instance, which illustrates my point well, impressed me distinctly, as it was furnished by one of the leading hospitals of Boston and by one of the good instructors of physical diagnosis in the Harvard Medical School. This physician examined a well-built, muscular young man, a light-weight wrestler by trade, who had lost almost no weight, looked perfectly well and complained only of hoarseness. The examination, signed and written by the physician, stated that "the chest was normal throughout, lungs showed no disease." I examined the patient the next day at the Boston Consumptives Hospital and found 3- and 2-line dulness throughout both chests, and fine crackling râles with cough throughout. The larynx showed miliary tuberculosis and the sputum contained numerous tubercle bacilli. I think that the first clinician failed to recognize this very serious condition because he had no fixed standard of dulness.

In 1912 I began to study the pitch of the various notes of percussion in an effort to establish for myself some definite standard I made a frequent practice, therefore, of whistling the pitch of the notes as I percussed the lungs. I soon learned that the variation between normal resonance and flatness was a range of over two octaves. This winter I have carried the investigation further. With an assistant, who has no medical training, I plotted out on the piano the notes which corresponded to what I had come to consider my personal standard of 1-2-3-4-line dulness.

In each instance I took at least six patients and did not tell my assistant what note I expected to find. At first she hummed the note, found it on the piano; then we freed our minds of the notes by playing chords. I next hummed or whistled the note and she found that note on the piano. A comparison of our two notes showed that we never differed more than a half tone. Later we concluded that an easier and more accurate method was to strike middle C and then work up or down the scale until both of us agreed that the note on the piano corresponded with the percussion note.

In this way we examined six cases for each note. We also came back to the same case two or three times after examining others to determine how well we would agree with our former notes. When I percussed the same individual in the same place, we always agreed with our previous findings. Not only did we agree on the note previously found in a particular case, but the notes for the different degrees of dulness were the same in a variety of individuals. This proved that the problem was purely a matter of pitch and not one of individual variations.

I determined in this manner that normal resonance is F or F sharp below middle C; 1-line dulness A below middle C to middle C; 2-line dulness E flat to F above middle C; 3-line dulness B flat to intermediate C; 4-line dulness E to F above intermediate C. Thus it will be seen that there is an interval of an octave between normal resonance and 2-line dulness, and an interval of another octave between 2-line dulness and 4-line dulness or flatness.

Has this any practical value? Or is it simply an interesting thing theoretically and musically, requiring a specially trained ear to detect these changes of pitch? I think that it does not need a specially trained ear; that it is of distinct practical value and can be acquired readily by anyone who has had these differences pointed out to him. If it is not practical, then percussion as a physical sign is not practical. The discussion of this point, however, brings me to the second part of my paper.

PART II

To percuss well, the stroke on the pleximeter must be sharp and quick. A rapid recovery is essential. The motion may be best illustrated by saying that it should be made exactly as a woodpecker uses his head in boring a tree. All the motion should come in the wrist, and none in the arm. This secures a crisp note. The pleximeter may be held flat, or raised so that only the end of the finger touches the chest. In the latter position a distinctly smaller area is percussed at one time. The note, consequently, is less disguised by the surrounding normal or semi-normal tissue. It is essential, moreover, to remember in a disease like tuberculosis that normal lung is always in intimate contact with abnormal. This change from a flat to fingertip pleximeter does not alter the pitch of the pathological note It only makes the note much more evident.

Of far greater importance than the proper manner in which to use the plexor and pleximeter, however, is the direction in which the chest is percussed. It should be percussed upward and not downward, from the base of the lungs to the apex and not from the apex to the base as has been taught so universally. This is so important that I wish to state my reasons for it carefully.

* Paper read before American Climatological and Clinical Association Atlantic City, June 20, 1914.

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A. It is much easier for the ear to pick up a higher note from a lower, than it is to do the reverse.

B. It requires a much lighter stroke to bring out the normal note than the pathological.

C. It is the rational plan to work from the normal as a standard toward the pathologic. The reverse leads to faulty standards.

D. The apices, as is well known, are most frequently affected and more rarely give a normal note. To start at the apex, therefore, is usually to commence with a pathologic note. This prejudices the further examination. With downward percussion, the higher note merges into the lower too imperceptibly to do accurate work. This is so for two reasons; first, as I have already said, the mind becomes prejudiced in favor of a pathologic note and consequently does not attempt to make fine distinctions; secondly, a heavier stroke is required for the pathologic note and when the more resonant is reached, the percussion is continued too heavily to detect what should be readily appreciated differences in the force of stroke necessary to bring out a good note. In this way the examiner deprives himself of a very important guide to collect accurate data.

The best place, therefore, to start the percussion of the lungs is the left lower front, as this is most often normal. From there, work upward to the apex, and record the various notes without percussing the opposite side. Then percuss upward on the right side and finally from side to side and alter your first findings, if necessary. The comparative note between similar areas of the two lungs is often misleading, as both may be pathologic. This comparison, therefore, should only be used later to correct first impressions and to detect or confirm fine gradations. In doing the backs follow the same order, left lower to apex, right lower to apex, then from side to side. If this order is followed, I am sure that interesting observations will follow as regards the usual progress of a disease like tuberculosis, and the relative frequency between incipient cases and chronic ones of long standing with marked reparative ability.

I am absolutely convinced that a fine ear for percussion can be trained only by this upward method. I have been much impressed by the rapidity with which students appreciate the difference between the two modes and the readiness with which they acquire a standard of dulness as a result of it.

I said that I considered that a musical standard is practical and can be taught easily to the non-musical. I should like to prove that these statements are true. In the first place, I have had no difficulty in teaching such a standard to quite a wide range of students, good, fair and poor.

How then can this be taught the non-musical man? In the first place, the mind must be entirely freed from all preconceived ideas as to what pathologic process underlies the varying degrees of dulness; what stage of the disease is indicated and what bearing the dulness has on the prognosis. I am sure that I am correct when I say that many men to-day consider that 3-line dulness over all of both chests means a hopeless condition of the lungs. This very attitude of mind prevents them from making what should be an accurate scientific record of what they find. One of the chief reasons why I have so little difficulty with students is because their minds are open. I have several times been told by older men that the patient whom I was examining was too well to have such extensive dulness as I claimed. I am convinced that, until a more uniform standard of dulness is adopted, we are in no position to discuss the pathology of 1-2-3-4-line dulness, when applied to such a disease as tuberculosis. At present such terms are as much of a hindrance as a help in the diagnosis and prognosis of chest cases.

In the second place, and in teaching students this occupies the first consideration, when resistance is felt under the pleximeter finger, the note is close to B below intermediate C or 3-line dulness. As we are all accustomed to this feeling of resistance under the finger when percussing, we have here not only an easy guide to any man, but also an accurate one. This observation depends on the muscle sense of the fingers of the physician and not on his ears. Until you feel this resistance, you have, therefore, to decide only between normal resonance and 2-line dulness.

Now the differences between normal resonance and 2-line dulness can be detected readily by the muscle sense also. Here, however, it is the muscle sense of the plexor rather than that of the pleximeter. There is a very definite difference between the gentle tap which is sufficient to bring out the normal note, and the decided stroke necessary to make the note of 2-line dulness loud enough to carry any distance at all. The physician who trains himself to start with very light percussion will quickly learn to appreciate these differences. That is why the examination should begin with that part of the chest which is most likely to be normal.

Although I have placed stress on the muscle sense of the pleximeter in detecting 3-line dulness, and on the plexor in detecting 2-line dulness, in both instances the muscle sense of both hands comes into play. As we measure the resistance under the pleximeter, we naturally measure the force of the plexor stroke. On the other hand, as we measure the lightness of the stroke of normal resonance in the plexor wrist, at the same time we measure the force of the stroke on the pleximeter. This, then, is as much a matter of training the muscle sense of the fingers and hands as it is of making use of a well-trained musical ear.

I wish to repeat, however, that one of the great barriers to acquiring this skill is the preconceived ideas which we have as to what the underlying pathologic condition must be for a given degree of dulness. I am free to confess that my physical examination occasionally makes it hard for some of my patients to enter the state sanatoriums. That is because more attention is attracted by my lines of dulness than by my report of symptoms.

CONCLUSIONS

1. Present methods of percussion are of little value, because, far from having any universal standard of dulness, there is not, in most instances, even an individual standard.

2. To a field in which there is no accurate standard, I bring some standard, to me one that is definite and easily acquired.

3. Normal resonance is F to F sharp below middle C; 1-line dulness, or impaired resonance, is A below middle C to middle C; 2-line dulness, or definite dulness, is E flat to F above middle C; 3-line dulness, or very marked dulness is B flat below intermediate C to intermediate C; 4-line dulness, or flatness is E to F above intermediate C.

4. No intelligent idea of diagnosis, prognosis, nor of the underlying pathologic condition can be formed by percussion without some such definite standard.

5. This standard can be acquired readily by the ear, and by the muscle sense of both hands, measured by the force of the plexor blow and the resistance under the pleximeter.

6. Upward percussion is an absolute essential of correct work. The old method of downward percussion should be discarded, and no longer taught to medical students.

PROGRESSIVE LENTICULAR DEGENERATION

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PHILADELPHIA

Although progressive lenticular degeneration, first described under that title by S. A. K. Wilson[1], is well established clinically, it has not often been encountered in this country. Since Wilson's first publication, in 1912, a number of cases have been recorded in foreign literature, but, with the exception of a case recently reported by Auer[2] and some brief references made before the neurological societies of New York and Philadelphia, little or nothing on the subject has appeared in American literature.

The patients whose histories are recorded here were admitted at different times to the wards of the Orthopaedic Hospital and Infirmary for Nervous Diseases, Philadelphia, and first came under the care of Dr. S. Weir Mitchell, and later passed to the service of Dr. John K. Mitchell. They have both been under observation for a considerable length of time. Examinations have been made repeatedly by various observers, and all the facts have been corroborated carefully from time to time.

CASE 1.—*History.*—B. R. H., man, aged 18. Patient's parents are healthy; a grandaunt was believed to have had myxedema; a first cousin and also an aunt had exophthalmic goiter. The patient was born at full term, the labor having been normal. He first walked and spoke at the usual age, and developed normally. He has never had convulsions or been otherwise ill. He was considered an unusually intelligent and attractive boy, always at the head of his class at school, and but for illness would have entered college at the early age of 14.

Present condition began when the patient was 14 years of age, while he was at boarding-school. The symptoms developed rather quickly, first manifesting themselves in the form of sluggish movements, indifferent table manners, a constant driveling of saliva, dysarthria and general lassitude. The condition continued for a number of weeks, and then the symptoms became more and more exaggerated. When first seen by his physician about six weeks after the onset, the patient appeared to be a driveling idiot, exhibiting general thickening of the skin and peculiar jerking movements of the extremities. A diagnosis of myxedema with multiple myoclonus was made, and thyroid extract administered. The mental improvement that followed was said to have been remarkable and almost immediate. Other symptoms attributed to the myxedema disappeared gradually in from one to three months, but the tremor became more pronounced. The thyroid medication was continued until the patient was 18 years of age. During the past two and a half years the patient's condition has remained stationary.

Physical Examination.—The facial expression is often quite vacant, especially striking being the more or less constant smile he wears. His complexion is dark and his hair is black; the skin is not thickened and in no way does it suggest a myxedematous change. Patient states that his complexion was always dark.

The pupils are equal in size and react normally to light, accommodation and convergence. The optic disks are normal, and the ocular movements are performed regularly; there is no nystagmus. When the patient winks, the eyelids occasionally remain closed and the lids cannot be elevated voluntarily without assistance. This appears to be due to a tonic spasm or contracture of the muscles of the eyelid. The mouth is not held open continually, but gapes more often than in most normal persons. The flow of saliva is not increased. The movements of the lower jaw, the tongue and the muscles of the pharynx and larynx are all performed with normal power. Laryngoscopic examination showed that the movements of the vocal cords were quite good, but somewhat slow. The hearing is normal. There is no difficulty in swallowing either liquids or solids. The voice is high pitched and has a nasal quality, and dysarthria is pronounced, being characterized by the slurring of syllables and the cutting off of the ends of words; the speech is quite different, however, from that of multiple sclerosis, in that the scanning tendency is lacking.

The movements of the facial muscles suggest a condition of spasticity. When tested by the customary methods, each of the cranial nerves appears to be normal. The thyroid gland is not enlarged, and the superficial lymph-glands likewise present no evidences of enlargement.

The left sternomastoid muscle is in a state of extreme hypertonicity, in consequence of which the head is often turned to the right; this is not, however, constant. The head can be rotated freely, but the rotation is accompanied by a fine tremor.

The musculature of the entire body and extremities appears to be good, but there is little subcutaneous fat, so that the outline of each muscle is well defined; nevertheless the patient does not appear to be emaciated. The skin everywhere is of a copperish-yellow hue, and a few small pigmented moles are scattered over the body. The most striking features are marked tremors, rigidity and a tendency to contractures, all of which are never absent, although they vary in intensity.

The upper extremities are in a state of almost continuous clonic tremor, more marked distally than proximally, and somewhat more exaggerated on the right side. The excursion of movements is wide, and the rate is rapid, but variable. On the slightest excitement or on exertion the tremor becomes violent. On attempting to place the palm of one hand against the cheek the hand strikes the face forcibly in a rapid succession of rhythmic flexor and extensor movements. A similar tremor of the lower extremities occurs while the patient lies in bed and on attempting voluntary movement of the trunk; it is also present when he is in the sitting and the standing positions. On starting to walk and in turning, one foot, generally the right, is thrown into a series of rapid clonic movements, the foot tapping the floor violently. When an effort, however, slight, is made to restrain the muscular movements, the tremor shows a decided tendency to involve the musculature of the entire body. At times, when the patient is standing quietly with his hands hanging at his sides, or when weights are placed in his hands, the tremor may disappear almost entirely for a few moments. The muscles of the entire body are in a state of more or less hypertonicity. The left foot is frequently in a condition of extensor spasm, assuming the equinovarus position, with the large toe flexed dorsally. On standing or in starting to walk there is often overextension of the trunk, and consequently a tendency to fall backward; equilibrium can be regained, however, by muscular effort. In this it differs from the uncertainty of ataxia, and appears to be due to muscular rigidity.

The abdominal muscles are tense and fixed, and the abdominal reflexes are equal and otherwise normal. Voluntary movements, such as are made in walking, are "wooden" and "mechanical" in character, and lack the smoothness that characterizes the working of a well-oiled machine, to which

1. Wilson, S. A. K.: Brain, March, 1912.
2. Auer: Am. Jour. Nerv. and Ment. Dis., June, 1914.

the normal body movements may be likened. Because of rigidity all voluntary movements are greatly retarded, yet the patient can perform flexion and extension of all joints, as well as adduction and abduction. Walking and rising from the sitting and prone position can be accomplished without assistance, but not, however, without considerable voluntary effort on the patient's part. The muscular power is unimpaired and does not differ in the extremities of the two sides, as estimated from the resistance exerted by the examiner. There is no paralysis present. With the exception of the incomplete contractures of the peroneal muscles of the left leg, the left sternomastoid and the elevators of the eyelids, previously mentioned, actual permanent contractures are absent.

Pain is never present, nor can any sensory change be discovered. The sensations, as tested for touch, heat, cold and pain, are everywhere normal.

The tendon and the cremasteric reflexes are all equal and entirely normal; they are active, but not exaggerated. There is no ankle-clonus, and no Babinski reflex is present. Owing to rigidity, overextension of the great toe sometimes occurs, and this could be mistaken for the Babinski sign.

Examination of the thoracic and abdominal organs reveals no abnormalities; the liver dulness is not diminished and appears to be normal. The systolic blood-pressure is 118. The electric examination gave entirely normal reactions. The blood and urinary examinations were negative, and there was no evidence of bile-pigment or other abnormalities in the urine.

The mental condition of the patient was fairly good; he was intelligent, although he lacked the power to concentrate, and was distinctly foolish and inclined to be childish, but apart from this nothing characteristic could be discovered.

Case 2.—*History.*—W. P., man, aged 36. Father is healthy; mother has had intermittent attacks of melancholia; one brother is well; one older sister and two brothers are afflicted with a condition similar to that presented by this patient, namely, tremors, spasticity and contractures of the muscles, which began in youth. This statement has been corroborated, but personal examination was not made. One of these brothers is mentally deranged, and displays outbursts of temper and other manifestations of disordered mentality. The other brother and sister are normal mentally.

This patient, as well as the other affected members of his family, was born at full term and developed normally. The present condition began in 1892, when the patient was 16 years old. The tremor at first affected the right side, the muscular rigidity and spasticity gradually increasing and spreading to the muscles of the neck, causing tremor of the head, and later involving the entire body and all the extremities. The patient was first seen in 1900, and has remained under observation ever since. He now presents a condition characterized by constant involuntary movements, the tremor increasing with emotional disturbances and voluntary effort, but not disappearing when he is at rest. The tremor is fairly regular, of the type which manifests itself by flexions and contractions, involving almost every group of muscles in the body; dysarthria is pronounced, but his speech is not marked by scanning.

Spasticity and rigidity of the muscles, as well as contractures are pronounced. The contractures are not permanent, however, except that affecting the larger muscles of the lumbar region, which causes the trunk to be bent to one side.

His physical inability seems to be due entirely to tremor, rigidity and apparent incoordination, and not to paralysis. All the tendon reflexes are slightly exaggerated, but equal. The skin-reflexes are normal. The Babinski sign is absent. Mentality is and always has been normal.

The disease was progressive at first, but five or six years after its onset it became stationary. Further examination shows nothing abnormal. The eyes present no abnormalities; there is no nystagmus, and sensation is normal. Both Wassermann and Noguchi reactions are negative. All thoracic and abdominal organs are normal, and there are no parasthesias; the sphincters functionate properly, and there is no ataxia or pain. The liver dulness is not diminished, and the patient asserts that he feels well. Electric examinations gave negative findings, and the urinary examination was also negative.

The clinical picture presented by these two patients differed but slightly, this difference being more particularly one of degree than of character. The two cases appeared to be of the same type. In Case 2 the disease seems to have commenced gradually, assuming a chronic nature from the beginning, but evincing no constitutional symptoms, the tremor having been the first visible evidence of the disease. This onset is similar to the one described by Wilson as chronic. In Case 1 the onset seems to have been acute, and the symptoms were regarded as myxedematous; after some weeks, however, these symptoms all subsided, but the tremor, rigidity and tendency to muscular contracture remained. The patient's mentality was impaired, and he displayed a tendency toward childishness. From the family history, and owing to the fact that the acute symptoms disappeared while thyroid extract was being administered, it might be assumed that some disturbance of the ductless glands was the etiologic factor; whether the acute symptoms merely subsided, as they always do in the beginning, or whether they really disappeared as the result of the thyroid treatment, is, indeed, questionable.

In neither case was there any clinical evidence of the presence of hepatic disease. The liver dulness was neither diminished nor increased in either case. The urine of both patients showed no abnormal characteristics, bile-pigment and the like being absent. The first patient did, however, exhibit a peculiar yellowish color of the skin, different from that of jaundice. This discoloration is undoubtedly similar to that described by Fleischer[3] and Rumpell.[4] Volsch's[5] (1911) patient also showed pigmentation of the cornea, a finding that was absent in my case.

The significance of corneal pigmentations when associated with tremor is still very uncertain, particularly when these are accompanied by skin changes and evidences of hepatic disease. This subject has recently been carefully studied by Holloway.[6] The first patient presented a very curious condition, in that he was unable to open his eyelids without assistance. In referring to this in his history it was spoken of as a form of contracture. I have never observed anything quite like it, and if it is part of the picture of lenticular degeneration, this manifestation has not previously been reported. At times when both eyes would be closed naturally the eyelids would remain closed and could not be opened voluntarily; when, however, the patient placed his index-finger on one orbital ridge and pushed upward, both lids could be elevated and the eyes remained open. This condition was markedly aggravated by any emotional disturbance, although the latter did not appear to produce the condition.

A relationship seems to exist between the disease known as progressive lenticular degeneration and the condition named by Westphal pseudosclerosis, the two diseases having some points of similarity. In December, 1912, I presented the patient here described as Case 2 before the Philadelphia Neurological Society as a case of pseudosclerosis, and called attention at the time to the possibility of the existence of lenticular

3. Fleischer: Deutsch. Ztschr. f. Nervenh., 1912, xliv, 179.
4. Rumpell: Deutsch. Ztschr. f. Nervenh., 1913, xlix, 54.
5. Volsch: Deutsch. Ztschr. f. Nervenh., 1911, xlii, 335.
6. Holloway: Am. Jour. Med. Sc., August, 1914, p. 235.

disease. Since then Strumpell[7] has reported a similar case, drawing attention to the similarity or relationship of these two curious clinical pictures. Westphal[8] himself has reported a case of pseudosclerosis with necropsy findings. He was able to discover distinct changes in the nervous system, chiefly of the glia nuclei, and more especially in the gray substance of the large ganglia of the cerebrum, and also in the dentate nucleus of the cerebellum. The nuclei of the ganglia-cells were enlarged, altered in shape, and were deficient in chromatin substance. In addition, the liver was distinctly reduced in size and presented a cirrhotic appearance. In reporting this case Westphal calls particular attention to the relationship that pseudosclerosis seems to bear to this peculiar morbid process, characterized by pigmentation of the skin, cirrhosis of the liver, tremors and mental and nervous phenomena. It is my belief that the first case here recorded might belong to this group.

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THE PRESENT STATUS OF ORGANIC IODIN PREPARATIONS *

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The flood of organic preparations of the various metals introduced into therapeutics during the past few years has carried with it a considerable number of organic preparations of the non-metallic elements, chiefly the iodids and bromids. The advantages of these preparations over the older inorganic combinations have in general not been carefully considered by the makers or users, but the popularity earned by the organic preparations of arsenic and mercury has led manufacturers to seek new fields of endeavor. In a previous communication[1] I reviewed the evidence regarding the various organic iodin preparations on the market. Since that time some new evidence has been brought forward, and a summary of our knowledge at the present time seems desirable.

The larger number of commercial preparations resolve themselves naturally into two classes: (1) iodin products of the higher fats or fatty acids and (2) iodized albumins. These two classes are so dissimilar that they must be considered separately.

The chief iodized fats and fatty acids on the market at the present time are Iodipin (Merck), Sajodin (Farbenfabriken von Elberfeld), and Iodival (Knoll & Co.) These substances are products of the addition of iodin to the higher fats or fatty acids or their derivatives, and contain varying amounts of iodin. They are sufficiently similar in their characteristics to allow of their being considered together. The advantages over the alkaline iodids claimed by the manufacturers are chiefly as follows: (1) absence of gastro-intestinal irritation, (2) slower absorption, (3) longer retention in the body and a more uniform rate of excretion, and (4) less tendency to produce iodism. The first claim is in general well substantiated, as all of these substances are bland and unirritating, the iodin being so firmly bound in the molecule as to be inactive locally. These substances are in general absorbed without much change in their composition, the absorption being similar to that of fatty acids, and much slower than that of the alkaline iodids. While 75 per cent. of the iodin given in the form of potassium iodid is excreted in the urine within twelve hours, and the highest amount in the urine is in the second hour, the absorption and elimination of the iodized fats is much slower. When Sajodin is given, iodin does not appear in the urine until after from one to three hours, and while the highest point in the excretion is reached within twelve hours the amount excreted remains high for thirty-six hours, giving a much more uniform rate of excretion. Following absorption, as shown by me,[2] the iodized fats are carried to the various parts of the body and deposited at least in part in the fatty or lipoid constituents of the cells, this agreeing with the theory of "lipotropie" advanced by Loeb. On this account the central nervous system, being rich in lipoids, is found to contain relatively much more iodin following the administration of an iodized fatty acid than after potassium iodid. After being stored in the lipoids of the cells these substances may, as suggested by Meyer and Gottlieb,[3] give off free iodin when the proper conditions are present. These facts explain the longer retention in the body and the slower excretion of iodin following the administration of these preparations. The iodin is excreted in inorganic form, and probably is effective in the body only after it is separated from the organic molecule. Its action and fate after separation from the organic combination would naturally be the same as if an alkaline iodid had been administered, and the only advantage gained would be in its being held and liberated more slowly, as no one of these preparations has been shown to possess a specific action beyond that of the iodin which it liberates. The fact that relatively more iodin is found in the nervous tissues probably has little bearing on the efficiency of these substances in cerebral syphilis, etc., as their lipoid solubility would not favor their entrance into syphilitic tissue. The lessened tendency to iodism claimed by many observers may be explained by the retention of the iodin in the lipoids and its slower and more uniform release in the form of available iodin. According to our present ideas iodism may be dependent on a high concentration of easily available iodin in the tissues. A high concentration may be reached for a short time by a relatively small dose of potassium iodid, but in the case of an iodized fat there is never this sudden flooding of available iodin. Where continuous small amounts of iodin are desired, as in arteriosclerosis, bronchial asthma, lead-poisoning, etc., this iodin may be supplied in a form non-irritant to the stomach as an iodized fat or fatty acid, and the probability of iodism would not be great. The iodized fats and fatty acids may be compared to the organic combinations of arsenic and mercury, in that they seem to allow to a certain extent the maximum of therapeutic effect with the minimum of toxic effect. When large amounts of iodin are desirable, however, as in cerebral syphilis, etc., the therapeutic effect seems to depend on the same property that causes the toxic effect, that is, the high concentration of iodin, and any effort to

7. Strumpell: Deutsch. Arch. f. Nervenh., 1914, l, 455.
8. Westphal: Arch. f. Psychiat. u. Nervenkr., 1913, li, 1.

* From the Department of Pharmacology, Medical Department, University of Oregon.

* Investigation supported in part by a grant from the Therapeutic Research Committee, Council on Pharmacy and Chemistry, American Medical Association.

1. McLean, Franklin C.: Organic Iodin Preparations, their Pharmacology and Therapeutic Value, Arch. Int. Med., November, 1912, p. 505.

2. McLean, F. C.: The Distribution of Iodin in the Cell Following Administration of Organic Iodin Preparations, Arch. Int. Med., to be published.

3. Meyer and Gottlieb: Pharmacologie, Berlin, 1911, p. 358.

decrease the concentration would result in a sacrifice of therapeutic efficiency.

The iodized albumins on the market are chiefly Iodalbin (P. D. & Co.) and Iodo-casein (Mulford). They are relatively unstable, and Iodalbin contains some free iodin and much more easily available iodin. Its claim for classification as an organic preparation is thus only partially borne out. As would be expected from the availability of its iodin, iodin appears in the urine within a few minutes after its administration. As I have shown[2] it completely loses its identity during the process of digestion and absorption, and its iodin is not found in the body in combination with protein. Any advantage of these preparations over the soluble inorganic iodids must lie in their behavior in the gastro-intestinal tract. In this way they resemble the organic iron preparations, most of which are protein in nature.

It has been repeatedly demonstrated that the iron preparations are not absorbed until after digestion and that their only advantage over the inorganic preparations lies in their better tolerance by the gastro-intestinal tract. In the case of iodized albumins there may be a somewhat slower absorption, owing to the time required for digestion, but their action and fate following absorption is practically that of soluble inorganic iodids.

Iothion (Farbenfabriken von Elberfeld Company) must be given a separate classification. It is chemically di-iodo-hydroxypropane, obtained by chlorinating glycerin and replacing the chlorin by iodin. It is recommended for local application and for percutaneous administration in solution in olive oil, and rapid absorption is claimed. It is apparently efficient in case percutaneous administration is desirable.

Another class of preparations, the iodized tannins, scarcely deserve classification as organic preparations. They are prepared in the form of wines or sirups, and contain tannin with a small amount of loosely combined iodin. The action of the small amount of iodin they contain is the same as the action of a corresponding amount of potassium iodid, as they decompose rapidly in the stomach.

The conclusions to be derived regarding the organic iodin preparations designed for general iodin medication are as follows:

1. So far as we now know these preparations have no specific action beyond the action of iodin after separation from the molecule.

2. The iodized fats and fatty acids, when small amounts of iodin are desired, seem to combine the maximum of therapeutic effect with the minimum of toxicity, chiefly because of their retention in the body and the slower release of the iodin. They are not of advantage when a high concentration of available iodin in the tissues is desirable.

3. The iodized proteins may be of some advantage in so far as they prevent gastric irritation and retard absorption of the iodin. Their behavior after absorption is the same as that of the soluble inorganic iodids.

4. Iothion and Iothion Oil are available for percutaneous administration, when that is desirable.

5. The sirups and wines of the so-called iodized tannins display no advantage over the soluble inorganic iodids.

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INJURIOUS EFFECTS OF FORCIBLE PASSIVE MOTION IN DISEASED AND TRAUMÁTIC JOINTS *

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The terms "passive motion," "massage" and "Swedish movement" are, to say the least, very confusing in their application, they are used in such an indiscriminate way, in books of surgery, essays, monographs, clinical lectures and by the general profession. In many instances these treatments are advised regardless of the anatomic and pathologic conditions of the joints involved.

Passive motion is a different treatment from massage or Swedish movements, but all three treatments are many times suggested in such a perfunctory manner that one might regard them as the same, and the results are disastrous, especially in inflamed joints and in many forms of infected joints, as well as injuries, fractures and dislocations at or near the joints, and seldom if ever is any good accomplished in establishing normal motion. Passive motion should be abandoned in joint diseases. Personally I do not recall a case in which it has been beneficial so far as motion is concerned, by the use of forcible passive motion, *per se*.

The fact that I have advocated, pleaded and almost begged for protection and rest for inflamed joints, with Minnesota physicians, and that the opposite treatment quite frequently is practiced by the regular profession and the general surgeon, leads me to think that these recommendations are either too feeble, or not well founded. Whether or not the latter is true, will, I hope, be decided in the discussion which may follow this short paper.

Frequently too, my stiff joint patients consult medical men in New York, Boston, Philadelphia and Chicago, and return with a very courteous letter to me advising passive motion, or that the adhesions be "broken up," and this followed by forcible passive motion. Such advice, however, has never come from a strictly orthopedic surgeon. This leads me to feel that possibly the Eastern orthopedic men have similar trouble in instructing and keeping the general practitioner and the general surgeon from assaulting these unprotected inflamed and stiffened joints by forcible passive motion.

At Asheville, N. C., the past winter, a patient from Boston with stiffened and painful joints was being treated under his home doctor by passive motion. The child's nose was filled with adenoids, and his tonsils were so large that he could not speak plainly. This experience was some consolation to me, as he certainly came from a city in which he could have received much better advice, and did, but his physician failed to listen or read.

As a teacher, as a consultant, and by patients, I am sure I am asked this question more frequently than any other: "When should forcible motion be commenced in a joint in order to establish the natural movements?" The answer is, "Never forcible passive motion under an anesthetic or even active motion when it causes pain." There is always a look of surprise,

* Read before the American Orthopedic Association at Philadelphia, June, 1914.

or an expression by word or letter, showing that the interrogator believes the answer cannot possibly be based on good mechanical reasons. They forget that the human joints are the highest form of mechanical contrivance, so far as action, pulleys, leverage, etc., are concerned, and unlike any manufactured mechanism in their ability to repair and self lubricate, and that human mechanism never becomes rusty or wears out; some disease or injury must occur to destroy joint motion, and in order to restore motion, this disease or mechanical obstruction must be overcome before motion should be attempted either by force or otherwise.

When the orthopedic surgeon advises against passive motion to establish permanent motion, one's mind immediately turns to manufactured joints, gummed wheels and rusted hinges, wear, lack of lubrication and their exposure to weather producing this stiffened condition, which never prevails in persons, and they do not appreciate that Nature's "first aid" to the injured or inflamed joint is neuromuscular spasm. If inflammation is not checked by rest and constitutional treatment, or both, a stiffened joint will result, and the adhesions and inflammation would be distinctly increased by motion, and would finally result in bony ankylosis.

To this day few medical men, except orthopedists, recognize the great benefit derived from immobilizing dressings in so-called acute rheumatism or infected joints from whatever cause, with the possible exception of tuberculous joints. Even in tuberculous joints they do not do so, I fear, from reason, or they would apply the same protection to every inflamed joint, from whatever cause, but rather from clinical facts gleaned from books and the constant warning and teaching of their orthopedic professor; nor would they be constantly asking when to begin passive motion in a tuberculous joint.

We who treat these cases daily are quite pleased with a cure in a tuberculous joint with motion; but would we not all feel more secure with a cured tuberculous joint with the limb in good position and the joint immobile? I myself never advise passive motion, nor do I advise the patient to use forced motion in a cured tuberculous joint, no matter how many years the joint has been free from any evidence of disease. In former years I have been guilty of advising patients in a mild way themselves to increase motion gradually by using a little force after I felt that the disease was entirely eliminated; but in many instances inflammation was lighted up again, abscesses formed, or the disease appeared in other parts of the body, even after every evidence of inflammation in the joint had disappeared many years before.

Certainly there are many neglected deformed tuberculous joints which can be straightened only by force. I refer to joints after the inflammation has so far subsided and they are held in the deformed position by contracted tendons and inflammatory adhesions. Even in these I almost never use force until I have attempted to overcome the deformity by rest, combined with extension, or, if I find that under an anesthetic there is motion, I frequently allow the patient to come out from under the anesthetic and complete the correction by rest and extension. While this takes a much longer time, the results compensate for the time and there is less likelihood of abscesses or disseminated tuberculosis. In our state cases, in which we have no time limit in the hospital, we have thoroughly tried this out, and we are convinced that we have gained time in this way rather than otherwise. So enthusiastic are we that many times in old flexed hips from tuberculosis, even though by using considerable force under ether we could overcome the flexion, if we feel that the adhesions are sufficient to prevent its flexing further we have done a subtrochanteric osteotomy rather than use force.

I have, even in chronically flexed thighs with slight motion and no pain, advised no mechanical treatment until the hip was fixed, in order later to perform a Gant's operation. This advice was given in cases of adults and when the patient could not spare the time longer for mechanical treatment.

In inflammatory stiffened joints, from any cause, passive motion is contra-indicated. The so-called stiff joints from arthritis deformans, in chronic, acute and subacute cases, respond to rest and extension, combined with constitutional and local treatment, better than from passive or active motion, until all pain has disappeared. Then if there is a little motion the patient is instructed very positively not to force motion beyond the point of pain.

It is surprising, as stated above, since these facts are so generally known, that in text-books of general medicine and surgery so little attention is paid to the importance of holding all acutely inflamed joints quiet by cast, brace or splints. I have not seen any form of acute inflammation of a joint, even gonorrheal, result in ankylosis, if immobilization by means of a splint, cast or extension be continually applied during the early and painful period, unless the joint disease was suppurative. Certainly even in suppurative cases they are much less likely to be stiff if immobilized after opening and draining, both of which we know are always indicated when pus is present, but never passive motion.

One cannot always ascertain by roentgenoscopy how firm are the bony ankylosis or fibrous adhesions. Frequently when the subject is chloroformed, gentle flexion and extension will demonstrate motion. If it gives without much apparent tearing of the tissue, one should stop before completing the full arc of motion. The joint should not be worked by moving the distal end back and forth like a pump handle, for every such motion increases the inflammation, and tears adhesions, which would otherwise stretch by extension and limited use.

We are constantly hearing and reading about gentle passive motion in sprains. On what theory this advice is based it is hard to conceive by those of us who are constantly being called to treat the injurious effects of such procedures. Certainly we know that a sprained joint can be immobilized too long, but we also know that there is an acute stage even in a simple sprain when rest is the treatment, and especially is this true, as the sprain is accompanied always by a stretching of the tendons, capsules and ligaments and more or less synovitis; and many times, and perhaps always, there is not only stretching, but also rupturing and tearing of the structures mentioned above. How often do we see in sprains of the shoulder, after a few days at most, passive motion begun, and later, as the shoulder becomes more and more painfully stiff, forcible passive motion under an anesthetic, "to break up the adhesions," until the patient himself discovers, as he states, that the shoulder is getting worse and more stiff after each manipulation?

Probably the greatest destruction of joint tissue occurs in fractures in and about the elbow joint, wrist

joint, and the ankle joint, by attempting to improve motion and deformity by passive motion.

Many surgeons seem to think that if they place a fractured elbow in a straight splint, with elbow in full extension, or full flexion, or the old-fashioned way of partial flexion, that this is all that is necessary. Any fracture anywhere in the body should be examined by Roentgen ray after the splints are applied, to see that all of the fragments are in anatomically correct positions. If this is done the joint will never require further treatment other than use to develop motion, except possibly now and then in nervous cases, and then only just a start, but never passive motion. Even in cases in which bony deformity in the elbow prevents full flexion and extension full use of the arm is often developed in a year or two by active motion.

I recall such a fracture in a young boy about 9 years old, son of an army officer. The father was very much exercised over the matter as he wished to have his son go to West Point, and later enter the army. This could not be if the boy did not have full use of his right elbow. The injury had occurred about six months previous to the time of my examination. Two months previously the attending surgeon began passive motion both with and without narcosis, and the father was instructed to work the arm back and forth three times a day regardless of the boy's protest. Naturally, when I saw it the elbow was intensely swollen and painful, so much so that the bony position could not be made out. A cast was applied, and instructions given to carry the arm in a sling. At the end of two weeks the cast was removed, and the tenderness and swelling had so far subsided that it was easily demonstrated that a portion of the inner condyle of the humerus was in front of the joint. But there was also, to our surprise, some motion. I advised an operation either to replace the fragment or remove it, to which the father objected, as it moved better than it did before the dressing was applied. He continued to object as the boy continued to improve, simply by active motion, and no attempt whatever, either by the boy or any one else, was made to force it. At the end of two years he had perfect motion in every direction, which he would not have had, I am sure, if the passive motion had been continued, and possibly not if he had been operated on.

Numerous similar experiences have led me to give the following advice in all cases of injured joints in children, where there is a little motion: "Keep the joint quiet until all pain and inflammation have disappeared, and then just use it naturally, flexing and extending up to the point of pain." Since following this procedure, out of a great number of children only two required operation, as the joint motion in all other cases was so nearly perfect that it was unnecessary.

I feel that by the "let alone" treatment in such cases, the inflammation of the joint subsides, the inflammatory thickening disappears, the callus lessens, and the fragments or displaced bones in the children do not increase in proportion to the growth of the joint. This, together with the compensatory changes in the joint, and, most of all, no passive motion to combat Nature's healing, is the reason for these finally good functional elbows.

Fractures near the wrist joint, usually designated as Colles' fractures, furnish the most marked ill effects of passive motion, and naturally too, as our text-books on surgery are filled with advice as to when to begin passive motion, not massage or actively moving the fingers, but passive motion to the joint. This increases the irritation, the callus, the inflammation and certainly the tendon adhesions.

When the dressing is removed there always appears marked swelling and edema in fractures about the joint, and the patient, if he can endure the pain, must submit to passive motion, or have it done under anesthesia, which continues the swelling and inflammation. Sometimes the bones, too, are in bad position. Of late, since the Roentgen ray is so universally used, this complication is quite uncommon. In most of these wrist fractures, after the splints are removed, if a simple bandage were applied to immobilize, to a limited extent, and active motion only to the point of pain allowed, the patients would, without assistance, obtain good and painless motion.

In fractures in and about the ankle joint, and in any form of inflammation here, for that matter, we get the greatest interference with motion from the contraction of the Achilles tendon owing to the foot naturally dropping in this position, or, I regret to say, frequently being dressed in the position of equinus which, unless one is very mindful, will occur. This tendon is so very strong that in cases of stiffening following an improperly dressed fracture or inflammation, I prefer, if necessary, to divide the tendon to place the foot at a right angle, rather than do so by extensive force, as it will always be followed by more or less trauma to the joint.

In chronic rigid flat-foot, with the foot in the position of pronation, and the heel cord shortened, the better and quicker result will follow if, instead of forcibly correcting the deformity by manipulation, we tenotomize all contracted tendons, and then immobilize in the overcorrected position, and after the inflammation has disappeared, proceed with the usual mechanical protection.

After fractures of the patella, if there is slight motion in the knee-joint, give the patient a chance and he will gradually loosen the joint. In several instances the patella has again been fractured by forcible passive motion.

If a joint requires loosening, or bony adhesions take place, motion should be stopped just as soon as it is loosened, and no attempt should be made to complete flexion and extension. This should be followed by the usual orthopedic treatment for an inflamed joint. Then the patient should be instructed gradually to begin using the joint, as the irritation disappears, which will be indicated by the lack of swelling and the disappearance of pain.

I have not mentioned in this article other forms of treatment which might be employed to loosen joints and reduce inflammation; neither do I wish to condemn open operations to remove or fix misplaced bony fragments, when indicated, though too much of it is done, which could be accomplished mechanically.

I have tried to demonstrate that so-called passive motion to loosen joints, as a treatment, *per se*, is injurious. Hippocrates must have had this in mind when he said, "Hard rubbing binds."

The Moral Equivalent of War.—The martial type of character can be bred without war. Strenuous honor and disinterestedness abound elsewhere. Priests and medical men are in a fashion educated to it, and we should all feel some degree of it imperative if we were conscious of our work as an obligatory service to the state.—William James, *Popular Science Monthly.*

THE DETERMINATION OF THE NEXT DOSE IN TUBERCULIN THERAPY*

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In the determination of the appropriate dose for the individual patient lie both the difficulty and the danger of tuberculin therapy. A dose in excess of the exact amount required frequently proves disastrous and has even hastened death. The possibilities of giving the wrong dose are increased by the very wide limits of tuberculin dosage, one patient requiring a dose one thousand or one million times that required by another patient, who is sometimes apparently of the same type.

There is no way of determining accurately the proper dose for a patient who has never taken tuberculin. The initial dose is always a matter of guess. Experience and judgment may indeed help one to guess more correctly, but they do not insure accuracy. White and Williams estimate the initial dose from the size of the areola produced by a von Pirquet test made with a definite amount of tuberculin; but they use this method only for incipient afebrile cases and the dosage they use I would be afraid to employ. My own rule with regard to the incipient dose is to give an amount that will probably do no harm. When beginning tuberculin treatment, therefore, I give, in incipient cases, one ten-millionth to one millionth of a milligram; in moderately advanced cases one billionth to one one-hundred-millionth of a milligram, and in far-advanced cases one trillionth to one billionth of a milligram. My reasons for giving this dosage I have explained at length in a previous communication.[1]

The dose for a patient who has already been given tuberculin, however, should not be determined by guess, but by careful estimation. It is here that judgment and experience count. From the effect produced by the last dose of tuberculin we can determine the amount to be given at the next dose. The dosage must be distinctly individual. It is impossible to generalize in tuberculin therapy or even to group our cases. There is no rule of thumb to guide us, nor any general plan of approximate dosage. We must study critically in each individual patient the phenomena that have followed the previous administrations of tuberculin, and from the data presented decide what the next dose in that case should be.

In order to pass an intelligent judgment it is important to have a clear idea as to the effect one desires from the use of tuberculin. There are really three methods of giving tuberculin. Sahli, Denys, and most of the German authorities, as well as Trudeau and his associates in this country, desire to accustom the patient gradually to large doses of tuberculin without causing any reaction in the process. Others, such as Koch, C. Spengler, Petruschky, Löwenstein, Möller and Pickert abroad, and White in this country, endeavor to give the dose that will just produce a slight reaction. The English school, including Latham and Inman, and Bullock and others in this country, aim to give the dose that has a favorable influence on the symptoms and to maintain this dose until it loses its effect. I am in thorough accord with this third group and partially agree and partially disagree with the other two groups. This becomes possible if we distinguish between favorable and unfavorable reactions. I regard as signs of a favorable reaction: improvement in appetite, increase of strength, a feeling of well-being, lessening of the symptoms, flattening of the temperature curve, and all favorable phenomena occurring on the day tuberculin is given or on the day following. An unfavorable reaction is shown by weakness, fatigue, drowsiness, headache, malaise, anorexia and increase of the various symptoms on the day of or on the day after tuberculin treatment. I try to give the dose that will produce a favorable reaction—which is really the object sought by Latham and his school. At the same time I half agree with those who desire to produce a reaction, only the reaction I aim for is a favorable one. Inasmuch as I try to avoid producing an unfavorable reaction (unless very slight) I again half agree with those who would avoid reactions. This statement of the effects I seek to obtain and to avoid will explain the method I employ in determining the dosage.

The effect of tuberculin can usually be seen in the opsonic curve, the leukocytic count, the leukocytic differential picture, the Arneth count, the temperature curve, the subjective and the objective symptoms and the physical signs. A study of all or of any one of these will give valuable information as to its action. Wright recommended that dosage be regulated by the effect on the opsonic index, but the difficulty and the errors in making the test and the fact that three or more determinations of the index each day are necessary for accuracy, render this method impracticable. Strickler and I, in a preliminary communication,[2] suggested that tuberculin dosage be regulated by the effect on the Arneth and the lymphocytic curves, but we have not yet examined a sufficient number of cases to permit us to speak with any authority on this point. Dürel[3] determines his dosage by its effect on the Arneth index, but as his results differ from those of Strickler and myself, all I can say is that in his hands it seems a safe and accurate guide. The time required for a differential count militates against its availability as a routine procedure, especially in the hands of the busy practitioner and among patients who cannot afford to pay for such laboratory tests. It is possible, on the other hand, by carefully studying the clinical symptoms and the temperature curve, to gain some knowledge as to the effect produced by each dose of tuberculin; and, indeed, Latham and Inman[4] have shown that when a patient suffering from tuberculosis feels better and his symptoms show amelioration, his opsonic index is raised, and that a falling index is often associated with a peculiar frontal headache just above the eyebrows, with lassitude and a general feeling of malaise, with loss of appetite, a quickened pulse, increased expectoration, restlessness and inability to sleep. It has been my experience that slight clinical symptoms of an unfavorable reaction occur before there is any notable alteration in the temperature. These slight symptoms are often unnoted by the patient unless his attention is particularly

* Read before the Philadelphia Clinical Society, May 4, 1914.

1. Solis-Cohen, Myer: The Use of a Very Minute Initial Dose in Tuberculin Therapy, New York Med. Jour., 1913, xcviii, 268.

2. Solis-Cohen, Myer, and Strickler, Albert: The Effect of Tuberculin Treatment upon the Leukocytic Picture (a preliminary report), New York Med. Jour., 1912, xcv, 53.

3. Dürel, Wallace G.: The Polynuclear Neutrophil Leukocytic Count as a Guide for the Administration of Tuberculin. Tr. Nat. Ass'n for the Study and Prevention of Tuberculosis, 1912, p. 415.

4. Latham, Arthur, and Inman, A. C.: A Contribution to the Study of the Administration of Tuberculin in Pulmonary Tuberculosis, Lancet, London, 1908, ii, 1280.

called to them and sometimes can be elicited only by persistent questioning. In order not to miss this important evidence as to the effect of the doses already given, which must serve as a guide in the determination of the next dose, I always question the patient closely as to how he feels on the day of the tuberculin and on the day afterward, as compared with the days of the interval between doses. Of course one should avoid leading questions and should be careful not to suggest the answers. I ask, for instance, if the appetite on the day tuberculin is given is the same as, or better than, or worse than on the day preceding or on the day following the dose, or on the next day. Every new symptom and every change in an old symptom I put down as possible evidence of a reaction—favorable or unfavorable. To be on the safe side, in regulating the dosage I regard the occurrence of new unpleasant symptoms or the exacerbation of old symptoms on the day of or after the dose as probable evidence of an unfavorable reaction.

The next dose of tuberculin can be the same as or greater than or less than the last dose. In determining this dose I am guided by the following rules:

The next dose should be the same as the preceding dose, when the latter was followed by a favorable reaction, such as a feeling of well-being, rise of spirits, increase of appetite, fall of an elevated temperature to normal, or reduction of the extent of the daily fluctuation; or when the preceding dose was followed by a very slight unfavorable reaction that lasted but a few hours, or at most a day, and was then followed by an improvement in the symptoms or general condition.

The next dose should be less than the preceding dose if the latter caused symptoms of an unfavorable reaction, such as rise of temperature, increase of symptoms, malaise, anorexia, pains, loss of weight, etc. (with the one exception just mentioned), or if definite and prolonged painfulness and inflammation occurred at the site of injection—the so-called skin reaction. If the rise of temperature and the other symptoms lasted but a few hours, the dose should be reduced slightly—a half, for instance. If the rise and the symptoms lasted all day, the next dose should be one-tenth, or less, of the preceding dose. When the reaction has been marked or has lasted several days in spite of rest, the next dose should be one hundredth to one thousandth of the last dose.

When the last dose has had no effect of any kind, it should be increased at the next administration. Even in febrile cases in which no change one way or the other is noted in temperature or symptoms, the dose should be increased until signs of a favorable or an unfavorable reaction appear. When the effect of a hitherto appropriate dose is passing off, as shown by the last dose being followed by a rise to a higher level of a temperature which has been kept down, or the reappearance of more marked daily fluctuations and an increase of symptoms which had been ameliorated, the next dose should be increased.

The rate of increase in ordinary cases should be about 50 per cent. of the preceding dose. The course of tuberculin so commonly given in series of nine doses beginning with 100 per cent. increase and ending with an 11 per cent. increase, followed again by 100 per cent. increase in the next series, I consider dangerous. The scheme is represented thus: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, etc. If a scheme is desired the following is much safer: 1, 1.5, 2, 3, 5, 7, 10, 15, 20, 30, etc. Occasionally, when a very minute initial dose is given without the slightest effect, a more rapid rate of increase—not exceeding 100 per cent.—may be justified, provided the patient is closely watched and quizzed for the first appearance of a slight reaction. In patients who have had to have their dose reduced on account of a reaction the subsequent increase or dose should be made very gradually and cautiously, from 10 to 25 per cent. of the preceding dose being sufficient increase.

The length of the interval between doses requires consideration. Ordinarily, in patients who have shown no effect of any kind from tuberculin and in those who are doing well on it, an interval of seven, five, or even three days is usually satisfactory. It is best to begin with a seven days' interval. In advanced cases and in susceptible and nervous individuals, and with the larger doses, ten days would often be better. After an unfavorable reaction one must wait until all the reactive symptoms have disappeared. If the reaction has been severe it is best to postpone the next dose until a week or more after the disappearance of all symptoms. When the depression of the temperature curve lasts but three days and then rises until the next dose is given, or when the symptoms that have been ameliorated return after three days, the next dose should be given at the end of three days, just before the effect of the preceding dose has passed away. One can often tell from the reappearance of fever and other symptoms about the length of time one dose of tuberculin exerts its influence and can then give the next dose as the effect of the last is wearing off.

The dosage and the interval are of the utmost importance in the use of this dangerous remedy. A physician who does not wish to give the time and attention their determination demands, should never administer tuberculin. Otherwise he cannot obey Hippocrates' injunction to do good or do no harm.

COLLARGOL IN PYELOGRAPHY

WITH REPORT OF AN INTERESTING CASE

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In looking up the literature on the subject, I find but few mortalities reported following the use of collargol, but a number of cases in which great damage has been done the kidney as shown by subsequent operation. The pathologic findings in these cases have been similar but the theories as to the cause of the destructive action of the remedy differ with the various observers.

There is also great divergence of opinion as to the toxicity of this drug; some claiming that it has an irritating and even cauterizing effect, while others assert that it has no injurious effect whatever on the pelvic mucosa, the tubular epithelium or other tissues of the kidney. There are still others who seem to be of the opinion that the kidney cells have the power of ingesting and distributing the drug throughout the entire kidney, in other words, the theories are that the drug may be distributed by absorption or by active diffusion under pressure.

From my own observations, I am of the opinion that the injurious results following the use of collargol in pyelography are from a diffusive process under pres-

sure rather than passive absorption. We are all familiar with the idiosyncrasies of certain people to certain drugs. I have seen in some cases more reaction follow the use of silver nitrate in 0.025 per cent. solution injected into the kidney pelvis than I have in others in which a 5 per cent. solution was used. There is no reason why a patient should not have the same idiosyncrasy for collargol and why a spasmodic contraction of the kidney pelvis should not be set up when the pelvis is filled with the collargol solution. Should a contraction occur while the ureter is blocked with the ureteral catheter and filled with this preparation and held in, even though the solution is not being injected at this time, is it not perfectly reasonable to suppose that diffusion would take place under pressure? This gives the gravity method a decided advantage over the syringe-forced method, since the fluid would have a back flow under nephritic pelvic contractions; yet I do not believe this is without danger.

CASE REPORT

History.—The case I wish to report was referred to us by Dr. Gibbon for cystoscopy and radiography for persistent symptoms suggesting nephritic lesion. The patient was a married woman 35 years old, fairly well nourished. She had borne no children and enjoyed good health until three years previously when she suffered with acute cystitis and apparently never fully recovered from it. She was admitted to the hospital April 16, 1914. A roentgenogram was immediately taken of both kidneys and they proved to be negative as to stone. The ureters were then catheterized. A perfectly clear urine came from the right intermittently. This indicated that there was no hydronephrosis on that side. Chemical and microscopic examination of this urine was negative. The urine from the left kidney was cloudy and came away continuously until nearly 3 ounces of urine had been withdrawn, when it became intermittent. This urine contained pus, a few blood-cells and a few hyaline and granular tube-casts, which showed that we had to deal with a left hydronephrotic kidney.

A 10 per cent. solution of collargol was injected slowly into the pelvis of the kidney with a syringe until the first indication of distention or pain was experienced by the patient and a roentgenogram was taken. Twelve c.c. of the solution were injected into the pelvis of the kidney. This could not have filled the kidney pelvis more than half full at most. The catheter was allowed to remain for probably ten minutes to allow the collargol to drain away. There was no obstruction to the ureteral catheter to prevent the outflow of this preparation, or indications of hemorrhage.

A few minutes after the injection the patient complained of pain which gradually grew severe, the pulse weak and rapid, and she presented the appearance of a very sick woman. She suffered immediately almost complete suppression of urine, the catheterized specimens ranging from 2 to 3 ounces each twenty-four hours. This was loaded with albumin and blood. Morphin was given for the pain and various remedies were administered and applied to counteract shock but with no decided results. Her pulse ranged from 104 to 120, temperature from 96 to 100 F. until death on the fifth day. Large hemorrhagic areas appeared around the site of each hypodermatic injection. The patient suffered severe hemorrhage from mucous surfaces and especially from the mouth and bowel.

In this case an amount of collargol not more than one-third of the pelvic capacity was used.

It was impossible to get a complete post mortem in this case but fortunately I secured the kidneys. The pathologic report is as follows:

Pathologic Findings.—The left or injected kidney is somewhat harder than normal over certain areas. Pelvis about twice the size of the opposite or normal kidney. Just beneath the capsule at the upper pole and at the lower half of the anterior surface of the kidney are seen dark areas which are evidently collargol deposits. There is hemorrhage beneath the capsule at these points. The capsule is slightly adherent over the pelvis. On section, the cortex is very soft to the touch except where collargol is deposited. The pelvis and calices are partially filled with clotted blood. The pyramids are deep red. The cortex is grayish brown.

The right kidney is about normal in size, flabby and soft to the touch. Capsule slightly adherent. On section, no collargol is seen grossly. The pyramids have a pinkish color. Microscopically, the collargol is seen through the whole of the section. It is seen almost entirely in the interstitial tissue. A few granules are seen in some of the larger blood-vessels. The whole section is almost bloodless except for areas of old hemorrhagic spots in portions near heavy collargol deposits. The cells of only a few of the glomerular tufts show nuclear staining.

Microscopically, the right kidney may be divided into two distinct zones, one composed of the straight collecting tubules and the other the convoluted tubules and glomeruli. In the lower zone the blood-vessels are filled with blood. They show granules of collargol both in the lumen of the tubules and within the leukocytes. Several tubules contain hyaline casts. The cells of some contain granules of collargol.

In the cortical zone the blood-supply is completely cut off. There is diffuse degeneration both parenchymatous and interstitial. The individual cells of the tubules and glomeruli have lost their outline completely, the whole being composed of granular material. The outline of the tubules and glomeruli is still visible in most instances.

From gross and microscopic appearance we would say the changes present are due in the injected kidney to a mechanical blocking off of the blood-supply, probably from pressure of collargol in the kidney tissue. In the right kidney the condition is due to cutting off of blood from the secreting portion of the kidney. What caused this lack of blood-supply has not been ascertained from the gross kidney or from the sections examined. It may possibly be due to collargol embolism.

The disastrous results and findings in this case led me to perform the following experiments on dogs:

EXPERIMENTS ON DOGS

Dog 1 was etherized, the bladder opened, ureteral catheter inserted into the right ureter for about 4 inches and 10 c.c. of a 10 per cent. solution of collargol were injected slowly into the pelvis. The dog died within five minutes thereafter. On post-mortem examination, we could find no special cause for the sudden death of the animal.

Gross examination of the right or injected kidney shows a dark green or black appearance beneath the capsule of the whole organ. On opening the kidney blood-clot and collargol are present in the pelvis near the opening of the ureter. The whole kidney is somewhat darker than normal. Collargol shows grossly only at the poles. The deposits are pyramid-shaped, being narrow near the pelvis and broader toward the cortex.

Microscopically, the collargol is seen in the tubules, blood-vessels and the interstitial tissue. It is thickest near the pelvis where there is considerable flattening out or massing of the tubules due to pressure. No collargol is seen in the glomeruli.

There are clots in the heart and especially the right side presenting a greenish appearance, due to collargol. There is no macroscopic lesion of any of the organs other than the injected kidney.

Microscopically, the liver shows collargol throughout the whole organ. The collargol is present in the intralobular capillaries. The capillaries are dilated and congested. No collargol is seen in the liver cells. Some of the larger vessels in the portal canals show minute granules of collargol.

No collargol is seen in the heart-muscle or interstitial tissue. Many of the vessels in the heart-wall show numerous granules of collargol. This is seen in the walls of both ventricles.

Granules of collargol are seen in many of the alveolar capillaries of the lungs and in a few of the larger vessels.

Dog 2 was etherized, the bladder opened and 5 c.c. of the solution were injected into the right kidney as in Dog 1. This animal did quite well and was killed in forty-eight hours. In gross appearance this kidney shows many small areas, black or green in appearance, over the whole surface just beneath the capsule. On the anterior surface near the center and at the upper pole are two larger areas having the characteristic color of collargol. When the kidney was sectioned these areas were seen to extend from the cortex to the pelvis. Above this the collargol was seen spreading out to the cortex.

Microscopically, the kidney shows acute diffuse nephritis. There are several areas of infarction, the kidney tissue being destroyed and its place being taken by leukocytes which show phagocytosis of the collargol. In the collargol area near the upper pole there is a distant break in the lining of the pelvis, the fissure extending about 2 mm. into the substance of the kidney. This break is partially filled with blood-clot. The collargol is present in the tubules, blood-vessels and interstitial tissue.

Macroscopic appearance of left kidney is normal. Microscopically, no collargol is seen. The kidney is apparently normal.

Macroscopic appearance of the liver, lungs and heart normal.

In the liver, microscopically, many of the endothelial cells show phagocytosis of small granules of collargol.

The lungs, microscopically, show a few deposits of granules in the interstitial tissue.

In the heart, microscopically, granules are seen in some of the larger vessels in the heart-walls.

In the spleen, microscopically, the large endothelial cells show phagocytosis of particles of collargol throughout the whole of the organ.

From the pathologic findings in this case and our experimental work on dogs, I am convinced that this preparation in pyelography is not without danger, and that we should continue our search for a substance less harmful for this purpose.

I am indebted to my associates, Dr. J. W. Squires and Dr. Harvey P. Barrett, pathologist at the Charlotte Sanatorium, for the radiographic and pathologic findings in connection with this work.

THROMBOPHLEBITIS OF THE SIGMOID SINUS OF OTITIC ORIGIN WITHOUT LOCAL MANIFESTATIONS

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The frequency with which the sigmoid sinus is involved in middle-ear inflammations is greater than was formerly suspected. This advance in our knowledge can be attributed to several factors: the more radical technic in operating on the mastoid and thus laying bare and exposing an unsuspected diseased sinus, and the comprehensive diagnostic aids which we resort to in interpreting the true condition underlying unusual cases of middle-ear inflammation. There is, however, one fact to be borne in mind—that the severity of an acute or chronic purulent inflammation is not the only cause of the possible extension of the original disease into the neighboring venous channels.

It is very possible for a mild acute inflammation of a very short duration, when the pain and discharge cease, to be followed in a few days by such serious complications as phlebitis and thrombosis of the sigmoid sinus. During this interval of apparent well-being, the patient and family may have paid no attention to the ear, while the patient may present a train of symptoms not at all referable to the ear but to some intercurrent acute affection, say of the abdomen or of the knee with their usual clinical pictures.

If medical advice be then sought, the patient may be found to have a temperature of 104 or 105 F., perhaps preceded by a chill. The slight ear disturbance of the previous week may have been forgotten. There may be at this time no subjective symptom referable to the ear. A physical examination is made, and possibly a tentative diagnosis of typhoid fever may suggest itself in the case of an adult, or, if a young child, a central pneumonia or an influenza. If the patient enter a hospital he may be considered a medical case, nothing of an otologic nature being suspected.

At the hospital a general examination is made, and nothing is revealed, whereupon an examination of the eye-grounds and of the ears is resorted to. I have had opportunity to see in a small hospital, in a comparatively short time, four cases of unexplained high temperature turn out to be due to sigmoid sinus thrombosis in patients who subjectively gave no evidence of ear disease. In addition to these four cases, I have had two similar experiences in private practice. My first experience was with a private case. The patient was a young man whose temperature had been high for a number of days, with marked remissions. He was under the care of an experienced practitioner, who could not account for the febrile movement. A few hours before I saw the patient, a laboratory expert, also an excellent clinician, saw the patient, but failed to interpret the high temperature. I was asked to see the case as an otologist as a routine measure.

I examined the temperature chart before seeing the patient. It showed the typical pyemia curve as we observe it in thrombophlebitis. The patient had no visible discharge from the ear, but down in the fundus of the canal was found a small quantity of foul pus.

There was no manifest pain anywhere around the ear, or any swelling in the canal. Ordinary pressure over the mastoid revealed no tenderness, whereas deep pressure on the mastoid at the auricle, on the level with the roof of the external auditory canal disclosed tenderness. Examination of the opposite side was negative. It was thus very apparent that we were dealing with a case of sinus thrombosis and not of typhoid fever. I advised immediate operation irrespective of the laboratory report, as I feared too much time had already been lost.

The patient was operated on at midnight. The mastoid was found to be markedly sclerotic, and on exposing the lateral sinus groove, thin pus welled up. Further exposure showed the entire sigmoid sinus to be empty, the sinus having disintegrated, while a large area of the dura was bathed in pus.

At the close of the operation the patient's pulse was very weak, either as the result of the shock of the operation or of the narcosis, or possibly of both, especially as the loss of blood was not great, and it was considered inadvisable to prolong the operation by ligaturing the jugular vein.

The next day there were symptoms of pulmonary involvement and nephritis, and further operative procedures were abandoned. The patient's condition was critical for five or six days; nevertheless recovery took place without further eventualities.

While the patient had ear symptoms, they were not marked enough to attract attention.

The second case also was one that I was called to see as a routine measure, because of a temperature of 105 without apparent cause. (This patient had chills with high temperature.) The examination of the ear showed a subacute process in the tympanum; the drum membrane was lusterless and somewhat boggy; there was no apparent swelling of the roof or posterior wall of the canal. Incision of the drum membrane gave vent to a slight serous discharge. This measure did not improve the patient's condition. Three other otologists saw this case, but none expressed a positive opinion, though the temperature continued to zigzag in the characteristic manner. Finally an abscess (metastatic?) showed itself somewhere in the abdomen, followed by others in other parts of the body. The patient eventually recovered. This history was obtained from the family physician, and I cite it even in this superficial manner because of my experience, in a similar case, with the mildest form of otitis.

This other patient was admitted to the hospital on the recommendation of her family physician as a typhoid suspect. She was a young woman from Eastern Europe, whose mind was not sufficiently clear to enable her to furnish a reliable history, but it was learned that ten days previously she had a slight pain in the right ear, for which she went to the outdoor service in one of the well-known otologic hospitals, where the drum membrane was incised. The pain continued but no discharge followed. I saw the patient at the request of the attending hospital physician, twenty-four hours after admission, as he could not reach a diagnosis. A slight swelling over the right knee was present. During this time the temperature had risen twice to 105, with a fall to 102, not accompanied by chills. The blood-count was abnormally low—5,500 leukocytes, and 85 per cent. polynuclears—which indicated profound sepsis with slight resistance. Examination of the ear revealed a lusterless and uniform drum membrane and canal free of secretion. The canal wall was perfectly normal in appearance, neither red nor swollen in the slightest degree. The mastoid was not tender to deep pressure, when compared with that of the opposite side. There was a suspicion of tenderness in the neck along the anterior border of the sternomastoid in the region of the tendon. An incision of the drum membrane showed it to be flabby, while the drum cavity contained only a slight amount of serous fluid; this latter, when examined microscopically, proved to be free from pathogenic organisms. A blood-culture had been made and proved negative. The agglutination test for typhoid was also negative.

A surgeon of large experience did not think the case a general surgical one, and an otologist expressed a negative opinion in regard to the possibility of a thrombosis of the lateral sinus.

In the meantime, the patient's temperature continued to rise and fall, ranging from 102 to 105 and 106, until a week had been wasted in seeking a cause for the temperature. No chill had been observed, nor any sweating. The patient took food; there was no disturbance of the bowels; the urine, however, showed some albumin and hyaline casts. The fundi oculi were normal. Repeated blood-counts showed the same leukocytosis. Delirium was frequently present. On the eighth day of the patient's stay in the hospital, I ventured to make an exposure of the mastoid and lateral sinus on the right side. The mastoid cortex and subcortical cells appeared free from pus and granulation tissue until the region of the antrum was laid bare, when a small quantity of creamy, odorless pus welled up. The sinus was found to be close to the posterior wall of the external auditory canal, and on being exposed was found to be solid almost from the torcula down to the bulb. A roentgenogram would have shown this very well. The neck was laid open for the removal of the internal jugular vein, and on incising the carotid sheath the jugular was found to be empty, the thrombosis having disintegrated into the sheath. Six hours after the operation the temperature rose to 108, and thirty-six hours after the patient succumbed. Two weeks later, by a strange coincidence, the surgeon who saw this case was called by a colleague to see a man who was having a temperature of 105, with a slight red swelling over the patella. The patient was asked casually by the surgeon whether he had had any trouble with his ears, and replied that two weeks previous he had had an earache with a discharge of fluid, but that it did not bother him further. The patient was removed to the hospital, though the otologist, a man of wide experience, believed that neither the ear nor lateral sinus was responsible for the condition. A positive blood-culture, however, resulted in a decision to open the mastoid and expose the lateral sinus, whereupon the sinus was found to be thrombosed. The patient likewise succumbed.

About a year ago I reported a case before the Otological Section of the New York Academy of Medicine, which had many of the features of the first case herewith reported, but which was first seen by me in a general hospital.

The report of this case aroused no discussion or comment. After the meeting, one of the members expressed surprise that no discussion was occasioned by the report of the case, as the experience was a rather unusual one. I could understand this, because his observation is limited entirely to an otologic hospital service. However, I am not unmindful of the fact that others have had experiences similar to mine, but the literature on this subject has been more or less buried away in periodicals devoted to otology, though the subject deserves a wider publicity.

In connection with this complication of otitis, either in recent or old cases, I would like to direct attention to the great importance that attaches to pain in the region of the ear, either spontaneous or induced, as a diagnostic factor in the clinical picture. This is apt to be misleading, for one cannot always depend on the pain factor as a symptom in the diagnosis of ear-disease and its complications.

1140 Madison Avenue.

The Code of Hammurabi.—Medical remuneration and the legal regulation of medicine were accurately defined as early as the reign of Hammurabi (c.2200 B.C.).

The laws of Hammurabi on this subject lay down that:

"If a physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumor (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

"If it be a freed man, he shall have five shekels.

"If it be any one's slave, his owner shall give the physician two shekels of silver.

"If the physician make a severe wound with the bronze operating-knife and the patient die, or if he open a growth with a bronze operating-knife and the patient lose his eye, he shall have his hands cut off.

"If a physician heal a broken bone or cure diseased bowels, the patient shall pay the physician five shekels of silver."—Neuburger, *History of Medicine.*

A CASE OF SPASMODIC ILEUS IN AN INFANT SIMULATING INTUSSUSCEPTION

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The following case is reported because of the rarity of such occurrence, judging from the literature.

Hilda B., aged 8 months, breast-fed, well-nourished, previously healthy infant, suddenly became ill at 7 p. m., July 28. Two hours later she was seen by me. The mother reported that the infant had a normal bowel movement about 5 p. m. and had been playful and happy until about 7 p. m., when suddenly it began to scream. The face became pale, a cold sweat suffused it, and the legs were drawn up over the abdomen. The screaming continued at about five-minute intervals, the child dozing between and not noticing any one.

On examination, I found the child listless and inclined to be drowsy, the thighs held flexed on the abdomen, twisting and squirming every few minutes as if in severe pain and crying out at intervals. The abdomen was flat, soft and relaxed with the exception of the upper right quadrant which was slightly rigid. Here a soft, smooth, cylindrical mass could easily be made out extending slightly across the midline just above the level of the navel rolling under the fingers. This spot was quite tender. The remainder of the abdomen was negative. The temperature was 97½ by rectum, pulse 130. Thd child had been given nothing except the breast. The mother, however, had been working very hard, ironing all day and was hot and very tired at the last nursing. A small soap-suds enema was given; the first portion returned clear, the very last was blood-stained and contained considerable mucus. No feces or gas passed. A rectal examination was negative, with the exception of about a dram of bloody mucus appearing on the withdrawal of the finger. Because of the suddenness of the onset, collapse, subnormal temperature, apathy alternating with crying spells, presence of a palpable mass, localized tenderness and the bloody mucous stools, a diagnosis of probable intussusception was made. The child was removed to the hospital for further observation. During the night the child vomited several times, first stomach contents, then a greenish-yellow fluid and a brownish liquid, was restless and cried out frequently. A bloody stool was passed, but no gas. The mass was still palpable in the morning.

Operation at 9 a. m., assisted by Dr. Kiesel. When the abdomen was opened the distended small intestine pressed up through the incision; this was traced downward for about 3 feet where the remainder of the small intestine was found in a state of complete collapse, absolutely empty and as flat as a piece of tape. The dilatation had ended as abruptly as if a clamp had been applied. The colon was normal but contained a considerable quantity of blood. The condition was that of spasmodic ileus. The intestines were replaced, abdomen closed, lower bowel washed out with saline solution, atropin and morphin administered. The infant was in fair condition after the operation and slept most of the day. There was no further vomiting; the bowels moved three times during the night, stools being of blood and mucus. Nursing was resumed on the second day; the following stools were normal with exception of a few greenish particles. Recovery was rapid, the child playing in the crib on the fourth day.

I have been able to find very little mention of this condition in infants in the text-books on children's diseases. Is it not probable that many of the reported cases of intussusception in which spontaneous reduction has been said to take place, and others, in which medical measures, enemas, morphin, etc. have been reported successful as cited by Still, Treves, Holt and others have been cases of spasmodic ileus and not cases of intussusception? I know of no safe way to differentiate the two except by an exploratory operation.

506 Dime Bank Building.

Therapeutics

PREVENTION IS GREATER THAN CURE

(*Continued from page 1297*)

IV

HOOKWORM DISEASE

(*Uncinariasis*)

This disease is found in all tropical and southern temperate zones; in the United States southward from the Potomac River latitude through to the Pacific coast. The symptoms are laziness, lassitude, weakness, loss of physical and mental ability and vitality, loss of weight and anemia. Children do not properly grow and adults become shiftless, incompetent, and poverty stricken, and they, with their families, become a tax on the community. Hence hookworm eradication is an economic question.

Hookworm disease is said to go back to ancient Egyptian times, but the parasite was not found until 1838, by an Italian; its relation to anemia was not discovered, however, until 1877, by Grassi and Colomiatti. It was named *Ankylostoma duodenale*.

The hookworm was discovered in Porto Rico by Major Ashford, Surgeon of the United States Army, but to Dr. C. W. Stiles of the United States Public Health Service belongs the honor of having found the worm in the southern states and of having shown that it differs generically from the Old World worm, but that it causes the same symptoms. The American type of worm is called *Necator americanus*.

Not to go into the life history of this parasite, suffice it to say that it may live in large numbers in the intestines of human beings for years, not only feeding on the blood and using up its nutriment, but biting the intestinal walls and causing hemorrhages, and by both means producing a progressive anemia. Eggs from these worms pass off with the feces, grow into minute larvae in the soil so contaminated, enter another human intestine, rarely by means of infected food such as uncooked vegetables and fruit. In the majority of cases the larvae pierce the skin of the leg or other part exposed to contaminated feces and reach the intestine. In this way a barefooted child or adult may acquire infection through exposure of his feet.

The excrement of carriers of the disease must never be allowed to infect the soil. Also every carrier must be discovered, and it is the duty of each community to discover and treat every carrier within its confines, and even to be suspicious of visitors.

The establishment of sewerage systems in cities should eradicate the disease from those localities. Compelling the erection and use of sanitary privies, be they ever so inexpensive and simple, is another necessary preventive measure outside of sewered towns. An old-fashioned privy, wherever found, should be abolished. Its odors are offensive, it breeds flies and contaminates the soil, and the drainage may reach water-supplies. A privy to be modern and sanitary should be properly ventilated and well lighted, but thoroughly screened with fine-mesh copper wire, to prevent flies and mosquitoes from entering the building. The building should be firmly cemented to the foundation; there should be no leaks or openings. There should be a hinged door in the rear, opening under the seats for cleaning purposes. The seat covers should be self-shutting. The excreta

should be received into a water-tight box or pail, and whether the wet or dry system is selected is a matter for the decision of the local health authorities. Just what disinfectant shall be used, chlorinated lime, or phenol (carbolic acid) solutions, or some oil that repels flies and other insects, is also for the decision of the local board of health. The sanitary privies recommended by the United States Public Health Service will be found described in United States Farmer's Bulletin 463.

Another preventive of infection by hookworm is to insist that shoes be worn in all infected regions.

The disease can be discovered by giving the specific treatment in a suspected case and then sifting or washing the stools through cheese cloth, when worms will be found, if present.

The treatment is to give little or no supper, and at bedtime a dose of magnesium sulphate. In the morning, as soon as the bowels have moved freely, one-half the dose of thymol, in capsules, is given, and in two hours the remainder of the thymol. Two hours later another dose of magnesium sulphate is administered. After movements of the bowels from this dose food may be taken, but only coffee or tea, without milk, should be allowed during the period of the treatment, namely, until the thymol has supposedly all passed out of the body. Absorption of thymol is not desired, as it may cause unpleasant symptoms. Alcohol and oils should not be given either before, during, or even soon after the treatment. For one hour after taking the thymol the patient should lie on his right side to hasten the passage of the drug and liquid through the pylorus into the intestines.

The dose of thymol depends on the age, but is large. Ferrell[1] suggests 4 gm. (60 grains) for an adult dose (that is, from 20 years of age upward). Doses for children and youth may be readily estimated by the following formula, namely: At 15 years, ¾ of the age, ¾ of the adult dose; at 10 years, ½ the age, ½ the dose; at 5 years, ¼ the age, ¼ the dose; at 2½ years, ⅛ of the age, ⅛ of the dose. If the patient is much underweight for his age, the dose should be reduced accordingly. The thymol should be powdered and placed dry in capsules. One-half the dose decided on is given at 6 a. m. If the bowels have been well moved from the dose of magnesium sulphate of the night before, the other half of the dose of thymol should be given at 8 a. m., both doses being taken with plenty of water. Ferrell adds sugar of milk in equal parts to the thymol, and says he thinks the drug acts better.

In one or two weeks the treatment should be repeated, unless the microscope shows the feces to be free from the parasite and its eggs. Sometimes a third and even a fourth treatment may be needed. The action of the thymol may be hastened by (at the moment of swallowing) uncapping the capsules.

Thymol when absorbed acts like phenol, but it is slowly dissolved by the gastro-intestinal fluids and hence, is absorbed slowly. Any oil or fatty substance hastens its absorption. Convulsions are probably not often caused by thymol poisoning, but great weakness and finally collapse are the gross subjective symptoms. Objective symptoms of its undesired absorption are albumin and even blood in the urine. Fatty degeneration of the liver and congestion of the kidneys and lungs are pathologic findings.

1. Ferrell, John A.: Hookworm Disease, The Journal A. M. A., June 20, 1914, p. 1938.

To forestall any possible great absorption of thymol after large doses are administered in hookworm disease, a brisk cathartic (Epsom, Glaubers, or Rochelle salt) should be given and repeated, if free catharsis does not occur within a few hours after taking the thymol. Castor oil, or any other oil, should of course not be the cathartic used. If symptoms of poisoning occur, stomach-washing, colon-washing, and sodium sulphate or potassium and sodium tartrate should be the means used to promote elimination. Strong black coffee should be given, and hypodermic injections of atropin, strychnin, and pituitary extract should be administered and the patient should be surrounded by dry heat. Later, any kidney congestion should be treated as an acute nephritis.

Except as a specific for hookworm, thymol should probably never be used internally. As a bowel antiseptic it is too dangerous a drug to be used repeatedly, unless the dose is too small to be of any value.

Ferrell's dosage for adults for hookworm disease is as follows:

	gm.	
℞ Thymolis.....	4	or gr. lx
Fac capsulas siccas 10.		

Sig.: Take 5 capsules, with plenty of water, in the early morning, as soon as the bowels have moved. Take the other 5 capsules in two hours. Two hours later take ½ ounce of Epsom salt, which should be repeated if it does not act in four hours.

MOSQUITO PEST

This ubiquitous tormentor may be eradicated and malarial fever abolished in most communities. It is only necessary to remember the following facts, and to act accordingly:

1. Salt water marshes diluted by fresh-water streams breed mosquitoes; kerosene oil will prevent their development.

2. These salt-water mosquitoes do not carry disease.

3. Fresh-water mosquitoes may carry disease (anopheles, malaria; stegomyia, yellow fever).

4. Fresh-water mosquitoes may develop in any little pool of water, in the street, in a back yard, in a tin can, in a pail of stagnant water, in a gutter or drain, and even when water stands in a vessel in a building.

5. Such pools of water being abolished, no mosquitoes can develop.

6. Kerosene, 1 ounce to 15 square feet of water, added from time to time to water that will not readily flow or tends to be stagnant, but cannot be eradicated, will prevent all growth of mosquitoes.

7. Mosquitoes, unless wind-blown, travel only a few hundred yards from their source of breeding.

8. Most disease-breeding mosquitoes are active only at night.

9. Fine mosquito-netting keeps them out of houses.

10. If they have entered a house they can only be thoroughly eradicated by complete fumigation.

11. If one must go to malarial districts, the prophylactic dose of quinin is from 3 to 5 grains a day of the sulphate.

OPHTHALMIA NEONATORUM

The prevention of this disease, so serious for the babe's future, is not attained by discussing the value of eugenics, or attempting the regulation of prostitutes, or demanding the always non-successful reporting of gonorrheal cases. It will be more certainly secured by insisting that every physician and every midwife (by continued and repeated instruction) shall

use Credé's method, namely, to instill into each eye of every new-born babe 2 drops of a 2 per cent. solution of silver nitrate. Every eye inflammation in the new-born or occurring shortly after birth should be considered ophthalmia until the microscope shows that it is an innocent inflammation. If gonococci are found, the little patient should be placed in the care of a skilled oculist.

TONSILS

The danger from chronically diseased tonsils is not sufficiently recognized by the majority of physicians, although specialists and bacteriologists have long urged that they are a menace to health and should be extirpated. Some laryngologists, and they have a goodly number of internists as followers, would extirpate (enucleate) all tonsils that have the least signs of chronic inflammation, especially if they are even slightly enlarged.

Before advising radical operation, that is, enucleation, it should be remembered that these glands probably have a function as outposts of our fortifications against disease germs, and when they are extirpated or are hopelessly diseased the deeper neck and bronchial glands become more readily affected by pathogenic germs. It should be remembered that complete enucleation is a major and serious operation. With the above caution, the therapeutic necessity of eradicating all diseased tissue in a tonsil by slicing, curetting, cauterizing, or, if need be, complete enucleation, is strongly urged. Also, as a measure of disease prevention, to eradicate tonsils containing infected pockets is more necessary than to pull or fill a decayed tooth.

It should be recognized that a tonsil may be badly diseased and yet not be prominent. Also, disease may proceed from a tonsil and yet there may be no immediate preceding tonsillar inflammation.

It has been shown that pathogenic germs, as pneumococci and various streptococci, especially hemolytic streptococci, may be harbored in diseased tonsils. These germs have been found so many times in acute and chronic arthritis and acute and chronic endocarditis, and in other infections, as to show a direct causation.

The surface bacteria may not give the cultures that the deeper-seated pockets or abscesses in the tonsils produce. Hence, in rheumatic cases, before the tonsils are considered innocent, whether a tonsillitis precedes the rheumatic attack or not, a careful examination of the tonsils should be made.

Infected tonsils may be the cause of influenza, chorea, nephritis, endocarditis, and various pyemic and septic processes, as well as of rheumatism. In fact, all and more than has been said of infected gums and teeth may be said of the danger of chronic suppuration in tonsils. The relation of tuberculosis to the tonsils has long been known. It is quite supposable that anemia, meningitis and neuritis could emanate from infected tonsils as well as from infected gums. While all diplococci found on tonsils are not pneumococci, the latter are found often enough to show that they could be a cause of pneumonia through the infection of others, if not in the carrier. Diphtheria, follicular tonsillitis, and, doubtless, scarlet fever, are caused by infection from carriers who have the causative germs of these diseases on or in their tonsils.

To summarize:

1. The total extirpation of non-suppurative tonsils is not necessary.

2. The extirpation of all diseased parts, or total extirpation, if it is necessary to eradicate the diseased portions, is proper treatment and advisable as soon as discovered.

3. Operative interference is therapeutically urgent in all cases of recurrent tonsillitis, in rheumatic cases, acute or chronic (arthritis deformans), in nephritis, etc., if the tonsils are found diseased.

(To be continued)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. ITS ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

CYMARIN.—Cymarin is a neutral, non-glucosidal substance obtained from *Apocynum cannabinum* L. and *Apocynum androsemifolium* L.

Actions and Uses.—Experiments on animals show that cymarin is about equal in activity to the official amorphous strophanthin, which it resembles closely in many of its pharmacologic actions, being far more active after intravenous or intramuscular injection than after oral administration. Toxic doses cause emesis through the action on the vomiting center in the medulla.

Its uses are much like those of digitalis, but it is not absorbed so readily from the gastro-intestinal tract, at least in animals, and probably in man; hence it is better suited for those cases in which intramuscular or intravenous injection is required to elicit the action promptly. (The usual precautions are necessary.)

Dosage.—Single dose for *oral administration* 0.0003 Gm. (1/200 grain); daily 0.001 to 0.002 Gm. (1/60 to 1/30 grain). Single or daily dose by intravenous or intramuscular injection, 0.0005 to 0.001 Gm. (1/130 to 1/60 grain).

Manufactured by Farbenfabriken vorm. Friedr. Bayer and Company, Leverkusen, Germany (The Bayer Company, Inc., New York). U. S. patent applied for. German patent No. 255,537. No U. S. trademark.

Tablets Cymarin.—Each tablet contains cymarin 0.3 mg. (1/200 Gr.).

Ampoules Cymarin Solution.—Each ampoule contains cymarin solution representing 0.001 Gm. (1/60 grain) of cymarin.

Cymarin was described by Taub and Fickewirth (*Arch. f. d. ges. Physiol.*, cliii, 239), and according to the German patent (No. 255,537) is prepared by extracting *Apocynum cannabinum* and *Apocynum androsemifolium*, with organic solvents at a low temperature to prevent decomposition of the active substance, and subsequent recrystallization.

Cymarin occurs as colorless, thick, prismatic crystals possessing a bitter taste. It is only slightly soluble in cold water, more soluble in hot water. It is difficultly soluble in benzene, ether and carbon disulphide, but dissolves easily in acetone, alcohol and chloroform. When heated it begins to soften at 130 degrees and becomes completely liquid at 135 to 140 C. Cymarin is very sensitive even to weak organic acids, although it is not a glucoside.

If cymarin be dissolved in hydrochloric acid (Sp. Gr. 1.19), a colorless solution results which on standing becomes green and on heating becomes turbid and then yields a resinous precipitate. If cymarin be dissolved in concentrated sulphuric acid a brown solution results. If a trace of cymarin be dissolved in 2 Cc. of glacial acetic acid, to which is added 3 drops of a 1:20 solution of potassium dichromate, a solution will be formed which, when poured on an equal volume of concentrated sulphuric acid, will exhibit at first a brown zone and above that a bright green colored layer. If a trace of cymarin be dissolved in 2 Cc. of glacial acetic acid, to which is added a drop of concentrated ferric chloride solution, a solution will result which, when poured on an equal volume of concentrated sulphuric acid, will develop a dark zone, and thea a bluish green line, which gradually colors the acetic acid a deep blue. If a trace of cymarin be dissolved in 10 Cc. of water and 5 Cc. of normal sodium hydroxide solution, a solution will result which when diluted with 1 or 2 drops of a hydrochloric acid solution of diazobenzene chloride or sodium nitrite yields a blue violet color, which, on acidifying changes to a brick red. If a trace of cymarin be dissolved in 2 Cc. of glacial acetic acid, containing a drop of bromine a solution will be formed which, after being warmed on the water bath a few minutes, yields a precipitate of white flakes on the addition of double the volume of distilled water.

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SATURDAY, OCTOBER 17, 1914

ALLEGED DANGERS TO THE EYE DISPROVED

The eye is of such supreme importance to man in the conduct of his daily life, and its mechanism is so delicate in its structure and adjustments, that it is quite naturally regarded as peculiarly susceptible to all sorts of offending agencies and exposed to a myriad of unsuspected dangers. Many of these fears and beliefs are well grounded. Some of them, on the other hand, have led to unwarrantable conclusions. Certain of the modern illuminants have acquired the reputation, in a somewhat popular way, of being dangerous by reason of injurious effects of the ultraviolet radiation delivered by them.

Drs. Verhoeff and Bell[1] of Boston have just published a preliminary summary of an extensive investigation of the effects of radiation on the various mediums of the eye from the corneal epithelium back to the retina. This work deserves careful study because they have properly emphasized the quantitative aspect of the questions involved. As expressed by them, the vital question is not whether a light source gives ultraviolet radiations, but whether it gives them of such kind, and in sufficient quantity, as to make an injury to the eye possible under practical conditions. The findings of Verhoeff and Bell are expressed, broadly, by the statement that no artificial source of light used for illuminating purposes contains enough ultraviolet radiation to involve the slightest danger to the eye from its effects under any readily conceivable conditions of use, and that such pathologic action as can be obtained experimentally from the ultraviolet is confined to a strictly limited region of the spectrum and obeys perfectly definite quantitative laws in its action.

Among the numerous interesting experimental facts definitely determined is the lack of penetration of most of the effects beyond the outer eye. Even with exposures as great as one hundred and fifty times the liminal for photophthalmia the lens substance is affected to a depth of less than 20 microns (1/1,250 inch), and this superficial effect undergoes in the rabbit complete repair. The lens protects completely the retina of the normal eye even from the small proportion of feebly abiotic rays which can penetrate the cornea and vitreous.

Experiments on rabbits, monkeys, etc., and observations on the human subject prove that the retina may be flooded for an hour or more with light of extreme intensity (not less than 50,000 luces[2]), without any sign of permanent injury. The resulting scotoma disappears within a few hours. Only when the concentration of light involves enough heat energy to produce definite thermic lesions is the retina liable to be injured. The retina of the aphacic eye, owing to the specific and general absorption of abiotic radiations by the cornea and the vitreous body, is adequately protected from injury from any exposures possible under the ordinary conditions of life, even without the added protection of the glasses necessary for aphacic patients. To injure the cornea, iris or lens, by the thermic effects of radiation, requires a concentration of energy obtainable only under extreme experimental conditions. Infra-red rays have no specific action on the tissues analogous to that of abiotic rays. Any effect due to them is simply a matter of thermic action, and such rays are in the main absorbed by the mediums of the eye before reaching the retina. Actual experiments made on the human eye show conclusively that no concentration of radiation on the retina from any artificial illuminant is sufficient to produce injury under any practical conditions.

Regarding a number of alleged pathologic effects which have been charged up against radiation, Verhoeff and Bell have this to say: Eclipse blindness, the only thermic effect on the retina of common occurrence clinically, is due to the action of the concentrated heat on the pigment epithelium and choroid, this heat being almost wholly due to radiations of the visible spectrum, within which the maximum solar energy lies. Erythropsia is not in any way connected with the exposure of the eye to ultraviolet radiations, but is merely a special case of color fatigue, temporary and without pathologic significance. In the case of vernal catarrh and senile cataract they can find no evidence for considering them as due to radiations of any kind. Glass-blowers' cataract, often charged to specific radiation, ultraviolet or other, is regarded as probably due to the overheating of the eye as a whole with consequent disturbed nutrition of the lens.

It is comforting to be told that commercial illuminants are entirely free from danger under ordinary conditions of their use. The glass enclosing globes used in all practical commercial illuminants are amply sufficient to reduce any abiotic radiations very far below the danger point.

1. Verhoeff, F. H., and Bell, L.: The Alleged Dangers to the Eye from Ultraviolet Radiation, Science, Sept. 25, 1914, p. 452.

2. The lux is the unit of intensity of light; it equals the illumination given by a standard candle at a distance of 12⅞ inches.

According to Verhoeff and Bell, further, the chief usefulness of protective glasses lies not so much in their absorption of any specific radiations as in their reducing the total amount of light to a point where it ceases to be psychologically disagreeable or to be inconveniently dazzling. Glasses which cut off both ends of the spectrum and transmit chiefly only rays of relatively high luminosity give the maximum visibility with the minimum reception of energy. For protection against abiotic action in experimentation, or in the snow fields, ordinary colored glasses are quite sufficient.

From the therapeutic point of view the Boston investigators maintain that so far as direct destruction of bacteria within the cornea or any other tissues of the body is concerned, abiotic radiations possess no value. This is due, they add, to the fact that abiotic radiations that are able to penetrate the tissues are more destructive to the latter than to bacteria.

THE BASAL METABOLISM OF MAN

Respiration apparatus designed for the estimation of the output of carbon dioxid and the absorption of oxygen—the gaseous metabolism—has now become sufficiently common in physiologic laboratories and even in hospital wards to cease to arouse the surprise occasioned by any scientific device of exceptional novelty. Respiration calorimeters which permit the direct measurement of the heat output are still decidedly uncommon adjuncts to the scientific outfit of the clinic, owing in part to the expense of construction and operation, and in part also to the lack of trained workers who are capable of experimenting in this field of the study of animal heat. The determination of the heat production by so-called indirect calorimetry—by calculation from the data of the gaseous metabolism and certain other factors—is developing into such satisfactory form that the respiration apparatus alone promises to supply adequate information regarding the heat output and energy metabolism, and to render unnecessary the more difficult procedures of direct estimation in a large number of conditions.

The entire subject here referred to has been developed to a point at which there is an imperative need of ascertaining what the "normal," fundamental metabolism and heat production are under recognized conditions. This necessity of establishing "standards" makes itself felt in all fields of investigation, in the clinic and laboratory alike, where new methods and new apparatus are brought into use. One is repeatedly confronted with the question as to what constitutes "normal" values and what are the ranges beyond which pathologic manifestations are unquestionably indicated. This inquiry has arisen in connection with various common constituents of the blood, like hemoglobin, sugar and urea; it followed in the wake of the earlier experiments with the electrocardiograph when the users of this sensitive and elegant apparatus began to be puzzled as to the interpretation of the great variety of "curves" furnished by the registration devices employed; and in a similar way the demand is arising for the establishment of some index of normal metabolism measured by the newer methods.

The impetus given to the study of the gaseous and gross metabolism in recent years has resulted in a large number of observations both in the domain of physiology and pathology. In recognition of the paucity of admittedly normal data the Nutrition Laboratory of the Carnegie Institution of Washington, in Boston, has now published a rather elaborate group of statistics gathered from measurements of many men and women.[1] The ranges of age, body-weight, and occupation in this list are wide and, therefore, exceptionally useful. Obviously the average values obtained even from people in presumably good health are likely to vary widely with the presence or absence of certain factors. Muscular activity plays a prominent part in determining the extent of metabolism, and the effects of various diets on it may become of no mean significance. The ingestion of food almost invariably produces some increase in metabolism. It has been found best, therefore, to attempt, in all fundamental measurements in this field, to eliminate the uncertain factor of food stimuli and to exclude as far as possible the element of voluntary muscular exertion. This is accomplished by studying the individual at complete rest and at least twelve hours after a meal.

Benedict and his collaborators have shown in the past that there is a clearly established relationship between the pulse-rate and the total metabolism.[2] Theoretically, therefore, the ideal condition under which to attempt to secure the minimum or basal metabolism would be at a period when the individual was having the minimum pulse-rate (as well as a body temperature well within normal limits.) In part these ideal requirements have been successfully met in the trials made in various places and compiled by the Boston laboratory. In quoting the figures of most immediate interest to the physician and of direct application to his work we shall not err widely in placing the basal metabolism of fasting man at rest at approximately one calorie per hour per kilogram (2.2 pounds) of body weight—a "round" number easily remembered. Exceptionally small individuals tend to exceed this average, though their requirements per unit of body surface (which Rubner recommends as the proper basis for comparisons) is not so widely divergent from that of larger subjects.

In a practical way this means that when a woman of 50 kg. (110 pounds) or a man of 60 kg. (132 pounds) body-weight is receiving a diet in which the

1. Benedict, F. G.; Emmes, L. H.; Roth, P., and Smith, H. M.: The Basal Gaseous Metabolism of Normal Men and Women, Jour. Biol. Chem., 1914, xviii, 139.
2. Pulse-Rate and Metabolism, editorial, THE JOURNAL A. M. A., June 28, 1913, p. 2049.

digestible nutrients do not exceed 1,200 to 1,500 calories in fuel value, they are unquestionably underfed even when at complete rest in bed. And when their energy requirement is increased by the inroads of fever with its stimulation of metabolism,[3] or by some degree of bodily activity, as well as by the food factor, higher levels of dietary wants are at once reached. The first step in satisfying any need is to have its extent clearly outlined.

THE ENTRANCE OF THE INFECTIVE AGENT OF EPIDEMIC POLIOMYELITIS INTO THE BODY

For only five years have we definitely known that anterior poliomyelitis must be classed among the acute infectious diseases. In 1909 Landsteiner and Popper reported the successful inoculation of monkeys with the disease, using for inoculation material an emulsion of the spinal cord of a patient who had died in the early stages of the disease.

Since then, notably through the researches of Flexner and his associates in this country, and of Landsteiner, of Levaditi, of Kling, Wernstedt and Petterson and of Römer abroad, many additions have been made to our knowledge of the disease. Especially is this true concerning the nature of the virus, the morbid anatomy and histology of the natural as well as the experimental disease, and the routes by which the virus escapes from the body.

Of especial importance has been the announcement by Noguchi and Flexner of the successful cultivation of the causative organism by the use of special methods of cultivation. Of important public-health interest was the finding of the virus in the nasal mucosa of healthy persons who had been in contact with persons sick with the disease. Such persons or "carriers" undoubtedly play a most important part in the epidemiology of the disease, and, on account of the difficulties connected with their detection, play an equally important part in the spread of the disease wherever such persons may go.

The discovery of the existence of such "carriers" is of more practical importance from the side of the prevention of the disease than was the discovery of the ambulatory cases. The important question of the means of entrance of the virus into the body has been under discussion with no definite conclusion having been reached. The early reports on the transmission of the disease by the stable-fly (*Stomoxys calcitrans*), as reported by Rosenau, indicated that the disease was transmissible by the bite of that fly, but the work of later investigators suggested that the disease was not usually transmitted in that manner. Some workers have steadfastly insisted on the transmission of the disease by contagion, with the nasal mucosa as the avenue of entrance. Among those who have held such views have been Flexner and his associates, and, in a recent paper, Flexner and Amoss[1] have produced experimental data of a convincing character in support of this view.

They report a large number of experiments showing the affinity between the virus and various organs and tissues, as shown by the infectivity of such organs and tissues from animals in which the virus has been introduced in different ways. It was found that when the virus was injected intravenously it was deposited promptly in the spleen and bone-marrow, but not in the kidneys, spinal cord or brain; and in spite of the affinity between the virus and the nervous tissues, the virus was not removed from the blood by the spinal cord and the brain until the choroid plexus and blood-vessels had suffered injury.

It would appear from their experiments that, although the virus is brought to the nervous tissues by the lymph, the distribution through the nervous system is, in large part, by means of the cerebrospinal fluid.

The authors believe that their experimental evidence supports the view that epidemic poliomyelitis is caused by the entrance into the body of the specific agent through the upper respiratory mucous membrane to the olfactory lobes, from which, by means of the cerebrospinal fluid, it is distributed throughout the nervous organs. They add, however, that in exceptional cases other modes of infection may occur.

Should it be that these authors are correct in their view as to the upper respiratory mucous membrane being the infection atrium, we will have a full explanation of the reason for the failure of efforts to control the disease that have not taken this view into account. Strict isolation of the sick and those who have been in contact with the sick should have a material effect in limiting the spread of the infection.

THE ARMY AND MENTAL DISEASE

The mental anguish, depicted by the numerous tales of suicide, madness and desertion among soldiers, to say nothing of mental frenzy expressing itself in wanton murder, that have come to us from our ill-fated friends across the sea, leads us to realize that there have been made as yet no scientific studies of the effect of war on the minds of officers and enlisted men in the army. Fortunately for our nation, there has been no opportunity to study the effect, on a large body of men, of short rations, loss of sleep, great emotionalism, exhausting exposure, excessive physical exertion, homesickness, etc., yet these in combination produce a strain that might well prove fatal to the equilibrium of many a mind that in regular routine would show no weakness. To be mentally sound in

3. Metabolism in Fever, editorial, THE JOURNAL A. M. A., Sept. 19, 1914, p. 1035.

1. Flexner, Simon, and Amoss, Harold L.: Localization of the Virus of Epidemic Poliomyelitis, Jour. Exper. Med., Sept. 1, 1914, p. 249.

such conditions is of more importance than to pass the eyesight test, or to be typhoid proof.

In the light of modern psychiatry it is rumored that more than one great battle has been lost by a general who was in the early stage of paresis, and doubtless dozens of men who have met the fate of deserters had their doom written in their brains, could their officers have read the signs of dementia praecox. Although the mental effects of war strain have not been studied, our War Department has been carrying on, under the Surgeon-General's advice, a very interesting inquiry concerning the mental status of the army.[1] The studies show that the mentally diseased, and those who are congenitally or otherwise mentally defective, form an important problem in armies and navies.

Of all the discharges for disease or external causes, practically speaking, one-fifth are on account of mental disease in some form. That is to say, out of 1,062 men discharged in 1912 on account of disability from all causes, more than 200 were found to be mentally diseased or defective during the year; and these did not include the retirements for neurasthenia or hysteria, which, although the patients are not insane in the accepted sense, are in reality mental diseases that will seriously affect one's efficiency in time of strain.

Of all the mental diseases, it was found that dementia praecox was by far the most frequent form; it averaged about 56 per cent. each year, of all the dismissals. In addition to these, there is no knowing how many cases there might have been among the soldiers who deserted through the year, or were dishonorably discharged on account of "previous convictions by summary court," or who attempted suicide. Many of them, without doubt had mild or unrecognized cases of dementia praecox.

The report gives a clear, concise outline of the modern conception of dementia praecox, explaining the way in which it may appear in the army in young men who have never shown any of the symptoms of irresponsibility when sheltered by their parents or friends, but who cannot "get along" when they are required to speak, act, and even think in prescribed and orderly fashion.

The symptoms, with the vivid case descriptions that follow, will afford the regular army surgeon much insight into cases that would seem to be merely undisciplined. In fact, the text of this bulletin will be of tremendous social value to every officer, as well as to any one dealing with large bodies of men whether in reform schools, prisons, factories or mines.

In the same clear, concise manner paranoid mental states are treated, also manic depressive psychoses, general paresis, syphilis of the nervous system, arteriosclerotic mental disturbance, hysterial psychosis and the constitutional psychopathic states.

1. King, E.: Mental Disease and Defect in United States Troops, Bull. 5, Dept. of War, Washington, D. C.

It is interesting to note that the military prisons frequently turn over men who have been convicted for desertion, assault, murder, theft, who were probably at the time suffering from mental diseases that were not recognized until they became so pronounced that the prisoners had to be sent to the Government Hospital for the Insane.

Even despite the advice of experienced alienists, men are condemned to death by jurors, instructed by lawyers who fail to grasp the significance of these peculiar disturbances in the emotional sphere—delusions, hallucinations and sexual perversities. The pages of this bulletin would be excellent reading for the occupants of the jurors' box in a criminal law court; for what holds true of enlisted men matches up in a pretty fair average to men in general.

NEW ASPECTS OF PURIN METABOLISM

The mysterious indefiniteness which was attached, only a few years ago, to the then newly coined word "nuclein" is rapidly disappearing with the advent of new and precise information. The word itself is being abandoned for the expression "nucleoprotein," which is intended to designate the salt-like combinations of protein and nucleic acids.[1] The latter can be disintegrated into a group of well-defined substances—purin and pyrimidin base, sugars, phosphoric acid—which may properly be looked on as the chemical units out of which they are built up, precisely as proteins are constructed out of amino-acid units. The purin bases, adenin and guanin (with their derivatives hypoxanthin and xanthin) have been the subject of exceptional interest because of their precursor relationship to uric acid.

Although the nucleic acids can be split up into these primary groups through the agency of vigorous hydrolytic procedures, Levene and his collaborators in the Rockefeller Institute have shown in a series of brilliant experiments that suitable methods of cleavage may lead to more complex fragments of the nucleic acids. Thus the phosphoric acid may be split off, leaving a residue of purin-sugar or pyrimidin-sugar compounds which have been termed nucleosids.

How are the nucleic acids prepared for absorption in the digestive processes? Are they broken down in alimentation into the simplest fragments, such as the purins, or do more complex groupings, like the nucleosids, arise? The question is analogous to that which has been raised in regard to the proteins, that is, whether they are absorbed in the form of amino-acids or of combinations of the latter in the guise of polypeptids. The phosphoric acid component of the nucleic acid is readily liberated by suitable enzymatic intervention; and the investigations of a number of biochemists who are active in

1. Compare Jones, W.: Nucleic Acids, Their Chemical and Physiological Conduct, Longmans, Green & Co., London, 1914.

this field leave little doubt that intact nucleosids may also arise among the products of fermentative reaction. Indeed, there is reason to believe that successive stages of decreasing chemical complexity can be identified in the digestive hydrolysis of the nucleic acids, precisely as in the case of the proteins or carbohydrates.[2]

If, then, the possibility of the absorption of nucleosids, as such, must be admitted, the study of their fate in possible contrast with the simpler purins or pyrimidins demands investigation. These glucosid-like compounds of purin and sugar, for example, still represent the structural grouping present in the original nucleic acid molecules. An added interest in them arises from the fact that the free purin bases and particularly adenin, which have hitherto been supposed to represent the products absorbed, are rather insoluble and apparently not devoid of toxic properties.[3] Adenosin and guanosin, on the other hand, are fairly soluble and can be injected into man in doses of a gram or more without untoward symptoms. This has been established in von Müller's clinic in Munich by Thannhauser and Bommes.[4] Furthermore, the injection of these nucleosids is followed by an increase in the output of uric acid, precisely as when nucleoproteins are ingested. A gram of guanosin induced the output of 0.5 gm. of additional uric acid, without any change in the uric acid content of the blood.

These unanticipated results made it appear highly probable that the water-soluble purin-sugar complexes —the nucleosids—may be the precursors of uric acid in the metabolism. It is quite conceivable that deamination and oxidation—both essential steps in the conversion of adenin and guanin into uric acid—take place before the sugar residue is removed from the molecule. Enzymes which can deaminate amino-nucleosids are now known;[1] and the probability of the participation of the nucleosids as such in metabolism is further enhanced by the fact that free adenin is admittedly toxic, and that adenase—the enzyme which deaminates adenin—has been missed in human organs and tissues.[1] To this may be added the indication that the purins circulate in the blood in some form other than the free bases.[5]

The probability that the nucleosids function as the physiologic precursors of uric acid in intermediary metabolism has also been subjected to the test in gouty subjects by the Munich investigators.[4] In severe cases the injection of the nucleosids (adenosin and guanosin) in 1-gm. doses is not followed by an augmentation in the excretion of uric acid. In milder cases there is an increase, though greatly delayed. On the other hand, the uric acid content of the blood in the gouty patients is invariably increased by nucleosid injections; and these usually precipitate so-called gouty attacks.

With respect to the theory of gout it is to be noted that the delay in the output of uric acid after nucleosid injections cannot be attributed to a delay in uric acid formation; for the content of the latter in the blood increases very promptly within a few hours. We are thus reminded that it would be a far-fetched hypothesis which would attribute the perversion observed in gout to anything other than a disturbance in the excretion of the uric acid.

2. Compare Thannhauser, S. J.: Experimentelle Studien über den Nucleinstoffwechsel. I. Mitteilung. Verdauung der Hefenucleinsäure durch menschlichen Duodenalsaft, Isolierung der Triphosphonucleinsäure, Ztschr. f. physiol. Chem., 1914, xci, 329.

3. Compare Minkowski, O.: Arch. f. exper. Path. u. Pharmakol., 1898, xli, 406.

4. Thannhauser, S. J., and Bommes, A.: Experimentelle Studien über den Nucleinstoffwechsel. II. Mitteilung. Stoffwechselversuche mit Adenosin und Guanosin, Ztschr. f. physiol. Chem., 1914, xci, 336.

5. Buss, R.: Arch. f. exper. Path. u. Pharmakol., 1914, lxxvi, 40.

THE AMINS IN COMMON FOODS

The amins have of late come into prominence as representative protein decomposition products arising through the action of bacteria on amino-acids. They are formed from the latter by the cleavage of carbon dioxid. Reactions of this type are known to take place under the conditions obtaining in the alimentary tract, though normally amins are not recovered from the intestinal contents or feces in detectable amounts. There are individuals in whom the long-known amins — putrescin (tetramethylendiamin) and cadaverin (pentamethylendiamin), derived from the amino-acids arginin and lysin, respectively — are found in both the feces and the urine. This has been true particularly in cases of cystinuria, though the precise connection between this anomaly and the diaminuria is not understood. It may be that amins arise in the gastro-intestinal tract through the action of the bacterial flora more freely than is currently believed, but that after absorption these derivatives are then promptly further decomposed by the body tissues and thus disappear from view. In the light of the fact that some of the amins are physiologically active and many promptly reappear in the urine in some form or other when they are introduced into the organism directly, it seems more probable that under the usual conditions of alimentation amins are not formed in such conspicuous quantities.

A more recent accession to the list of possible amins arising in the intestinal canal is beta-imidazolylethylamin, which can be produced from histidin through the agency of bacteria found in the bowel and which may possibly also be a product of cellular activity. The occasion for this statement is the observation that extracts of various tissues produce physiologic effects quite comparable with that incited by administration of this amin. This is particularly true of extracts of the hypophysis, which seems to elaborate products related to the amins. From the amino-acid tryptophan, indolethylamin is obtainable. The amins may exhibit a more or less pronounced influence on the animal organism. They stimulate the sympathetic nervous

system. Some of them compare with epinephrin in producing contraction of the arterioles and consequent rise in blood-pressure. Some of them, like imidazolylethylamin, markedly stimulate the involuntary muscles, notably those of the uterus. A further member of the group, oxyphenylethylamin, derived from the amino-acid tyrosin, has been identified as an active constituent of ergot.

There can be little doubt that since the amins are, under suitable conditions, characteristic products of bacterial action on proteins, small quantities are not only presumably formed in the bowel, but may frequently be present in food. It is, however, somewhat surprising to learn from competent authority that they occur regularly and in not inconsiderable quantity in so common a food as cheese. Oxyphenylethylamin had earlier been isolated in very small amounts from overripe Emmenthal cheese by Winterstein and Küng,[1] and even before that in detectable amounts from American cheddar cheese by Van Slyke and Hart.[2]

Now, however, Ehrlich and Lange[3] have easily separated the same amin in amounts corresponding to 0.06 per cent. of the fresh product from Swiss cheese of the finest edible quality; and they regard it as a regularly recurring constituent. There is no question that the amin owes its origin to the bacterial processes associated with the usual ripening of the cheese; in fact, the product is readily produced from tyrosin in suitable culture mediums by the action of bacteria isolated from cheese. Other types of cheese — the Camembert, Roquefort and Emmenthal varieties, for example — all yield the same amin.

The demonstration of the regular occurrence in foods of a compound which has a marked blood-pressure-raising potency and is identical with one of the toxic bases which lend a pharmacologic action to ergot[4] is of more than passing interest. One is reminded anew of the possibilities described in a general way as alimentary toxemia. There can no longer be any doubt that the foods we eat may contain preformed some of the physiologically active products which have hitherto been charged solely to the bacterial transformations initiated in the digestive canal by supposedly abnormal flora.

1. Winterstein, E., and Küng, A.: Ueber das Auftreten von p-Oxyphenylathylamin im Emmentaler Käse, IV. Mitteilung, Ztschr. f. physiol. Chem., 1909, lix, 138.
2. Van Slyke, L. L., and Hart, E. B.: New York Agricultural Exper. Station, Bull. 231, 1903.
3. Ehrlich, F., and Lange, F.: Zur Kenntnis der Biochemie der Käsereifung, I. Ueber das Vorkommen von p-Oxyphenylathylamin im normalen Käse und seine Bildung durch Milchsäurebakterien, Biochem. Ztschr., 1914, lxiii, 156.
4. The Active Principles of Ergot, editorial, THE JOURNAL A. M. A., June 20, 1914, p. 1969.

Susceptibility to Disease as Atavism.—The special vulnerability shown at times by certain tissues or cells as regards bacteria which at ordinary times do not trouble them may, perhaps, be looked on (apart from the occasions when it comes from a temporarily heightened virulence of these bacteria) as a reversion to a period in the individual or racial history prior to that at which immunity to these bacteria was acquired.—A. J. Brock, *Edinburgh Med. Jour.*

Current Comment

HIGHER DEGREES IN MEDICINE

Attention has previously been called[1] to a two-year graduate course offered by the University of Minnesota for the training of physicians who desire to specialize in ophthalmology. It was also shown that this course was a parallel to the graduate courses offered by several high-grade medical schools[2] for the training of health officers. In both courses those who expect to obtain the degree are required to have graduated from a medical college; in both instances definite, carefully planned courses of study have been laid down, and such higher degrees as are granted will hold a distinct educational value. Meanwhile, in these courses, instead of devoting his time exclusively to clinical work, the physician will also secure a thorough knowledge of the fundamental facts of anatomy, physiology, chemistry, pathology and the like, which have a direct bearing on his chosen specialty. Nowhere can such graduate courses be so carefully planned or so well given as in universities which are also equipped to give thoroughly the undergraduate medical courses. It is quite probable that following the example of these courses in public health and ophthalmology, similar courses will be established to prepare those who wish to limit their practice to the other specialties of medicine. It is highly important, therefore, that care be used in deciding what degree is to be granted in each of these specialties. A great multiplicity of higher degrees in medicine would lead to their being confused with the worthless lot now being granted by the innumerable drugless sects and fads. The University of Minnesota has shown wisdom, therefore, in providing one higher degree for all, that of Doctor of Science (Sc.D.), the particular specialty to be designated by adding the words "in surgery," "in ophthalmology," etc. Meanwhile, the establishing of these special graduate courses in high-grade universities points to a new field in which there are great opportunities for the development of medical education.

REGIONAL VARIATIONS IN THE CONTRACTIONS OF THE SMALL INTESTINE

A careful observation sometimes upsets preconceived notions in science by centering attention on facts which cannot be reconciled with current views. An illustration of this has been furnished by Alvarez in the physiologic laboratory of the Harvard Medical School.[3] It is commonly believed that the small intestine is a tube of uniform properties throughout. Alvarez was accordingly surprised to find that when comparable segments from different parts of this portion of the bowel were allowed to contract rhythmically in a suitable medium under identical external con-

1. Special Training for the Specialist, Current Comment, THE JOURNAL A. M. A., June 20, 1914, p. 1972.
2. Harvard University, the Universities of Pennsylvania, Michigan and Wisconsin, the University of New York, Tulane University and now the University of Minnesota have established courses in public health leading to the degree of Doctor of Public Health.
3. Alvarez, W. C.: Functional Variations in Contractions of Different Parts of the Small Intestine, Am. Jour. Physiol., 1914, xxxv, 177.

ditions, the rhythm of the upper end of the small bowel was decidedly greater than that of the lower. The rate, roughly expressed, varies inversely as the distance of the selected segment from the pylorus. The oral end of an intestinal loop beats with more regular rhythm and amplitude than the aboral portion. The amplitude of contraction of segments with approximately the same length is greater with segments from the ileum than with those from the duodenum. According to Alvarez the more rapid rhythm and the smaller amplitude of duodenal segments are apparently associated with a greater tone of this region compared with the lower ileum. The duodenal region is more irritable to mechanical and thermal stimulation than the lower parts of the small intestine; and it is suggested that the greater tone and irritability and the faster rhythm of the upper part are associated with more rapid peristalsis in this region.

INHERITED DEFECTS ATTRIBUTABLE TO ALCOHOL

The influence of alcohol as a detrimental factor in inheritance is one which has not readily lent itself to convincing experimental proof in the past. During the last four years Professor Stockard of the Cornell University Medical School in New York City has been engaged in a study of the effects of alcohol in heredity. He has demonstrated conclusively that the germ cells of males can be so injured by allowing the individuals to inhale the fumes of alcohol that they give rise to defective offspring although mated with vigorous untreated females.[1] The extension of these unique investigations, in which the offspring from the treated animals which reach maturity are usually nervous and slightly undersized, have further shown that the effect of the injury of the germ cells is not only exhibited by the immediate offspring of alcoholized animals, but is conveyed through their descendants for at least three generations.[2] There are many instances of matings followed by negative results or early abortions, stillborn young or defectives. An instructive illustration was afforded in a case in which two of the four young were completely eyeless, the eyeballs, optic nerves, and chiasma being absent. Such defects result, according to Stockard, from the injury originally inflicted on the germ cells by the experimental treatment. Yet this injury may have been received by earlier generations only. Thus the parents of the anophthalmic guinea-pigs just mentioned were untreated, their four grandparents were also untreated, but their great-grandfathers were all alcoholized and their great-grandmothers were all normal animals. The defective eyes of descendants are due to impaired development, not to the direct action of alcohol. Plainly the spermatozoön is actually weakened, if not disabled by the alcohol treatment and all individuals arising from combinations involving such a germ cell are likely to be below normal. There is food for reflection in these facts.

1. Stockard, C. R.: Arch. f. Entwcklngsmechn. d. Organ., 1912, xxxv; Arch. Int. Med., 1912, x, 369; Am. Naturalist, 1913, xlvii.
2. Stockard, C. R.: A Study of Further Generations of Mammals from Ancestors Treated with Alcohol, Proc. Soc. Exper. Biol. and Med., 1914, xi, 136.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Pellagra at State Hospital for Nervous Diseases.—According to the current monthly report of the State Hospital for Nervous Diseases, Little Rock, thirteen of the thirty-four deaths occurring during August were due to pellagra. It is said that there are more than seventy-five cases of the disease at the hospital.

Personal.—Dr. Owen K. Haydon, Conway, has gone to Europe as a member of the medical staff of the American Red Cross.——Dr. Robert E. Weaver, Hope, has been appointed house surgeon in the Missouri Pacific-Iron Mountain Hospital, St. Louis.——Dr. Chester Jennings, Little Rock, who has been seriously ill with cerebral hemorrhage, is reported to be improving.

Hookworm in Arkansas.—Dr. Charles W. Garrison, Little Rock, state director of the Rockefeller Hookworm Commission in Arkansas, reports that during the quarter ended September 30, the commission made 6,433 examinations, finding 895 infections with intestinal parasites of which 738 were infections with hookworm. The percentages of infection in the counties in which the work was carried on during the past quarter were the following: Crittenden, 19.9, Drew 15, Greene 13.8, Madison 6, Marion 25.3, Montgomery 12.9, Polk 10.9, Scott 6.7, Van Buren 16.9 and Chicot 3.8. Since coming into the state four years ago, the commission has made 49,961 examinations at a cost of about $60,000 and has found over 10,000 cases of infection. Dr. Tillman B. Bradford, Cotton Plant, began work in Searcy County October 5, and will remain about four weeks, visiting the rural schools of the county, and making his headquarters at Marshall.

COLORADO

Home from Abroad.—Dr. Oscar J. Pfeiffer and Dr. and Mrs. James Rae Arneill, Denver, have returned from abroad.

Dr. Work Wins Senatorial Nomination.—The returns of the state canvassing board show that Dr. Hubert Work, Pueblo, Republican candidate for United States Senator, received 22,413 votes, a plurality of 6,100.

DISTRICT OF COLUMBIA

Personal.—Drs. William Cline Borden and John H. Selby, Washington, have returned from abroad.——Col. Champe C. McCulloch of the Medical Corps of the Army, has purchased a residence at 1831 Lamont Street.

Urge Leper's Removal.—The commissioners of the District of Columbia have requested the Secretary of the Treasury, who has supervision of the United States Public Health Service, to take steps for the immediate removal from the district, of the burden of caring for John R. Early, leper, who returned to the district from the United States Quarantine Station at Diamond Head, Wash., in June last. Action is asked by the commision on the ground that Early never was a resident of the district and has no claim whatever on the government.

GEORGIA

New Officers.—Eighth District Medical Association at Athens, September 24: president, Dr. Daniel H. DuPree; secretary, Dr. Edward M. Coleman, both of Athens. The next meeting of the association will be held at Franklin Springs.

Personal.—Dr. David B. Hawkins, Atlanta, has started for Europe to work under the American Red Cross.——Dr. Harry R. Slack, Jr., La Grange, has been appointed a Red Cross staff surgeon and sailed for Europe September 5.——Dr. Emory R. Park, Atlanta, and Dr. Samuel Brock, Carrollton, have returned from abroad.

Hospital Plans Accepted.—Plans for the proposed Georgia Baptist Hospital, Atlanta, have been approved by the special committee of trustees and it is expected that work will begin soon after November 15. The plans call for a building to accommodate 500 patients and will cost about $500,000. The building will cover an entire block and will be made up of five units, each having accommodations for 100 patients.

ILLINOIS

Streptococcus Sore Throat.—The Illinois Board of Health has sent experts to Carbondale to investigate an epidemic of streptococcus sore throat, of which infected milk is supposed to be the cause.

Personal.—Dr. Vincent J. Cohenour, Joliet, has been elected physician of Will County.——Dr. Wilmot L. Ransom, formerly proprietor of the Ransom Sanitarium, Rockford, has established a new sanitarium at Roscoe.

Infantile Paralysis Epidemic Under Control.—The epidemic of infantile paralysis on the North Shore appears to have spent itself, no new cases having been reported recently. Strict measures are being taken to prevent any further spread of the disease.

IOWA

Home from Abroad.—Dr. and Mrs. Charles Ramage, Charles City; Dr. Elmer Weih, West Liberty, and Dr. Bert A. Bowers and family, Granville, have returned from abroad.

Clinical Laboratory Opened.—The clinical laboratory of Mercy Hospital, Davenport, installed at a cost of $3,000, has been opened and is in charge of Dr. F. H. Lamb, formerly of Ann Arbor, Mich.

State Board Bulletins.—The Iowa State Board of Health has issued special bulletins for general distribution, one on small-pox, setting forth the necessity of vaccination, and another on the health and care of babies.

KANSAS

Personal.—Dr. John C. Rudolph, Lawrence, has returned from Europe.——Dr. Franklin P. Hatfield, Olathe, has been appointed physician for the State Deaf and Dumb School in that city.

To Revise Medical Laws.—At the request of the Kansas State Medical Society, the governor has appointed the following committee to revise the medical laws of the state of Kansas and recommend changes to be brought before the next legislature: Dr. James Milligan, Garnett; Dr. Joseph E. Sawtell, Kansas City, and Messrs. W. L. Burdick, Lawrence; Fred Dumont Smith, Hutchinson, and F. T. Ransom, Wichita. The society in its letter to the governor declared that the Kansas laws having a bearing on the practice of medicine, are "inadequate, contradictory and confusing."

KENTUCKY

Personal.—Dr. Ernest Rau has succeeded Dr. Garland E. Huddle as health officer of Bowling Green.——Dr. Joseph N. McCormack, Bowling Green, who has been under treatment at Rochester, Minn., has returned home recovered.

Small-Pox Patients Lack Vaccination.—Of 714 cases of small-pox at the Louisville Eruptive Hospital during the year ended August 31, but one resulted fatally. The superintendent of the hospital calls attention to the fact that 99 per cent. of the small-pox patients received at the hospital had never been vaccinated or had been vaccinated without result.

University of Louisville Opens.—The Medical Department of the University of Louisville began its seventy-eighth annual session and its first year under the new régime, with a special program, September 28. The laboratories of the institution have been reequipped. The laboratories of pathology and clinical microscopy are maintained at the City Hospital under the direct charge of Dr. F. S. Graves, chief pathologist of that institution. The libraries of Dr. James M. Bodine and the late Dr. James B. Marvin have recently been added to the library of the institution which now numbers about five thousand volumes and is open during the entire day for the use of the medical profession.

Trachoma Clinic at Oneida.—Drs. Joseph A. Stucky and Samuel B. Marks, Lexington; Louie E. V. Stegman, Battle Creek, Mich., and C. Adaline McConville, Brooklyn, N. Y., with the assistance of the county physicians and local officials and several nurses, held a clinic for trachoma and other diseases during the week ending October 3 at Oneida, Clay County, in the heart of the eastern Kentucky mountains. Fully 300 patients were examined, twenty-six operations performed and nine lectures delivered. A well-equipped little hospital has been established at Oneida, but arrangements have been made for a larger hospital building. Dr. McConville has remained at Oneida to assist in the work for some time.

New Officers for State Society.—At the sixty-fifth annual meeting of the Kentucky State Medical Association held at Blue Grass Inn, Newport, September 22 to 25, the following officers were elected: president-elect, Dr. James W. Kincaid, Catlettsburg; vice-president, Dr. Frederick G. LaRue, Smithland; Dr. Charles L. Heath, Lindsey, and Dr. James C. Mobley, Elizabethtown; delegates to the American Medical Association, Drs. Milton Board, Louisville, and Arthur T. McCormack, Bowling Green; councilors, seventh district, Drs. Achilles W. Cain, Somerset; ninth district, Dr. Albert S. Brady, Greenup, and eleventh district, Dr. James S. Lock, Barbourville; orator in medicine, Dr. O. P. Nuckols, Pineville, and orator in surgery, Dr. Joseph G. Gaither, Hopkinsville. Louisville was selected as the next meeting place.

MARYLAND

Johns Hopkins' Anniversary.—The twenty-fifth anniversary of Johns Hopkins Hospital opened with a meeting at the Lyric on October 5. During the celebration an inspection of the Brady Urological Clinic, of which Dr. Hugh H. Young, Baltimore, is director, was made. This clinic is a gift of Mr. James Buchanan Brady of New York, and is the only one of its kind in this country. Tablets to Dr. Daniel C. Gilman, president of the university and organizer of the hospital, and to Dr. John Hewetson were dedicated and a portrait of Sir William Osler, by Sargeant, was presented.

Disease Prevention.—The Federated Charities, Instructive Visiting Nurses' Association, Tuberculosis Division of the Health Department, Babies' Milk Fund Association and Johns Hopkins Hospital Social Service Department, have completed arrangements for a course of public lectures to begin November 4 and continue to March 31. The scope of the lectures will include public health, the family, labor conditions, domestic science, children, social bearing on mental diseases, social treatment of specific diseases, pulmonary tuberculosis and diseases of the eye resulting from bad social conditions.

MINNESOTA

Windom Site Accepted.—The State Advisory Board has approved the selection of the Windom site for a district tuberculosis sanatorium.

School Inspectors Appointed.—Drs. Frank A. Grawn, John H. Andres and Murdoch A. Nicholson have been appointed medical inspectors of the public schools of Duluth.

Hospital Staff Appointed.—Dr. Herbert O. Collins, city physician of Minneapolis, has announced the general staff of the Minneapolis City Hospital. Under arrangements with the faculty of the University of Minnesota, one-half of the staff are members of the medical faculty and the other half are practitioners not affiliated with the school of medicine.

Sanitary Conference.—At the joint session of the Minnesota Sanitary Conference and the Minnesota Public Health Association held in St. Paul, September 30, the following officers were elected: The Minnesota Sanitary Conference, president, Dr. Ignatius J. Murphy, Duluth; vice-president, Dr. Emery H. Bayley, Lake City; secretary, Dr. Albert J. Chesley, Minneapolis.

Personal.—Dr. Samuel M. Kirk, St. Paul, has been obliged to give up his practice and is taking a long rest on a ranch near Arbsarobee, Mont.——Drs. William A. Jones and Carl J. Ringnell, Minneapolis, have returned from abroad.——Dr. Harold E. Robertson, Minneapolis, has been appointed bacteriologist to a hospital in Berlin.——Dr. John W. Lee, Minneapolis, has arrived in London from Vienna.

State Association Meeting.—The annual meeting of the Minnesota State Medical Association was held in St. Paul, September 30 to October 2, under the presidency of Dr. Alfred E. Spalding, Luverne, and the following officers were elected: president, Dr. John T. Rogers, St. Paul; vice-presidents, Drs. Lemuel M. Roberts, Little Falls; and Edwin S. Muir, Winona; secretary, Dr. Thomas S. McDavitt, St. Paul (reelected); treasurer, Dr. Earle R. Hare, Minneapolis; councilors, Drs. Frank R. Weiser, Windom; and Hugh F. McGaughey, Winona. Rochester was selected as the place of meeting for 1915.

MISSOURI

Personal.—Dr. Mazyck P. Ravenel, Madison, has assumed the duties of his new position as professor of preventive medicine at the University of Missouri, Columbia.

NEW JERSEY

Personal.—Dr. Fred M. Corwin has been reappointed medical inspector of the public schools of Bayonne.——Dr. Joseph S. Nicholson, Camden, is reported to be ill with pneumonia.

——Dr. Albert S. Harden has been appointed health commissioner of Newark.

Diphtheria Epidemic Checked.—Strict quarantine is believed by Riverside health officials to have checked the spread of an epidemic of diphtheria that caused the closing of the public school September 23. The boards of health and education decided, however, to keep the schools closed as long as necessary.

NEW YORK

Hospital for Children in Rochester.—A proposed certificate of incorporation for a children's hospital of Rochester, N. Y., has been sent to the State Board of Charities for approval. The following are named as directors of the proposed hospital: Drs. Montgomery E. Leary and John M. Lee; and Messrs. Clarence A. Barbour, Henry T. Williams and Michael J. O'Brien.

Personal.—Dr. Wilhelm Gaertner, Buffalo, has been appointed by the governor a member of the Public Health Council of the state to fill the vacancy caused by the resignation of Dr. Edward Clark who has been appointed state sanitary supervisor.——Mr. Garnet Smith, executive secretary of the Children's Welfare Association, New York City, has been appointed secretary of the Rochester Public Health Association.——Dr. Albert E. Mott, Akron, announces his retirement from the practice of medicine. He will reside in Canada.——Dr. Milton H. Goldberg, Buffalo, has returned from abroad.

Schick Test in a Diphtheria Outbreak.—During the months of April and May there was an outbreak of diphtheria at the Howard Orphanage at Kings Park, L. I., where there are about 260 children. Among the measures used for the suppression of the disease were the Schick test for the purpose of determining susceptibility of the children and the removal of tonsils and adenoids from carriers. From the epidemic the following conclusions were drawn:

1. The Schick test is of great value in detecting susceptible persons in an epidemic of diphtheria.
2. One thousand units of antitoxin usually afford protection for from 21 to 28 days, while a second dose, as a rule, protects for only about a week, as shown by the Schick test.
3. The indications of the Schick test are that the immunity conferred by an attack of diphtheria is usually of short duration.
4. The removal of adenoids and diseased tonsils is a valuable means of freeing diphtheria carriers from the germs.

New York City

Ship Held in Quarantine.—The Italian freight steamer, *Cerea*, which arrived from Italian ports October 2, has been detained at quarantine until the health officer of the port may be assured that the vessel is free from all suspicion of Asiatic cholera.

Surgeons for France.—The last of the surgeons whom it will be possible to send to France with the $1,000 supplied for that purpose by the Duchess of Talleyrand have been selected. Dr. David E. Wheeler sailed October 7 and those who will follow on October 17, are Dr. A. S. Cook, Dr. Thomas Nisbet, an intern in the French Hospital; Dr. S. C. Moore, an intern in Gouveneur Hospital; Dr. H. L. Cookingham of Red Bank, N. J., and one other.

No Quarantinable Disease Admitted to New York.—The annual report of Dr. Joseph O'Connell, Health Officer of the Port of New York, for the year ended September 30, shows that not a single case of quarantinable disease was admitted during the year. The department removed 571 patients from ships and 4,342 persons who had been exposed to quarantinable disease were held for observation. From 13 ships, 20 cases of typhoid fever were removed and treated with 18 recoveries. On account of the presence of plague in Havana, Santiago and New Orleans, the department fumigated during the year about 997 vessels for the destruction of rats.

Personal.—Dr. Benjamin White, formerly director of the department of bacteriology of the Hoagland Laboratory, Brooklyn, is now assistant director of bacteriological laboratories of the department of health, New York City, and is in charge of the Research and Antitoxin laboratories at Otisville.——Dr. Harold Lyall, formerly associate director of the department of bacteriology of the Hoagland Laboratory, is now bacteriologist at the Research and Antitoxin laboratories, Otisville.——Dr. William H. Allen, director of the Bureau of Municipal Research, has resigned.——Dr. Paul B. Clark, of the Rockefeller Institute for Medical Research, has been appointed associate professor of bacteriology in the University of Wisconsin, succeeding Dr. Mazyck P. Ravenel. ——Dr. H. McDonald Peggs has gone to Europe to make a reconnoissance in the war zone for the British Imperial Club. He goes first to England and then to the front to learn what surgeons, nurses and supplies are needed. The club will send what is recommended. Dr. Peggs then expects to serve with the British hospital corps.——Dr. John Ravenswood Hicks, New Brighton, has accepted Dr. Hermann M. Biggs's request to help organize local health work on such lines as promise a maximum return for a given amount of money expended. Dr. Biggs believes that before such an adjustment can be effected it will be necessary to secure some uniformity in health department accounting, so that the expenditures for various purposes in various communities may be fairly compared.——Dr. E. C. Baldwin of Ft. Wadsworth, bacteriologist and director of the old laboratory at the Quarantine Station, has resigned in favor of Dr. Oscar Teague, recently of Cornell.

OHIO

Hospital Reopened.—The Children's Hospital, Columbus, which was closed in August for renovation and improvements, was reopened October 1.

New County Society.—Through the efforts of local physicians of New Philadelphia, the Carroll County Medical Society was organized at Carrollton, September 17.

Personal.—Drs. Charles Sidney Smith, Frederick K. Kislig and Elmer R. Arn have been appointed assistants on the senior surgical staff of the Miami Valley Hospital, Dayton. ——Dr. William B. Bryant has been appointed assistant on the senior medical staff of the same institution.——Dr. Evan Cameron, Elyria, coroner of Lorain County, is seriously ill with pneumonia at the Memorial Hospital.——Dr. William H. Stover, Tiffin, after more than forty years of active practice, has moved to Toledo.——Dr. Elza A. Dye, Springfield, is reported to be seriously ill in the Springfield City Hospital. ——Dr. Mark Milliken, Hamilton, who has been seriously ill in the Mercy Hospital, Hamilton, with septicemia, is reported to be convalescent.

Cincinnati

Health Officer Meets Emergency.—Cincinnati, through the quick action of Dr. John H. Landis, health officer, has demonstrated the efficiency of a first-class health department to successfully meet a grave emergency. This city is separated by the Ohio River from several municipalities situated on the southern bank of the river in Kentucky. These municipalities include the cities of Newport and Covington. Ludlow, one of these communities, suffered an epidemic of scarlet fever, several hundred of its children being infected. These little ones were permitted to play on the streets, and quarantine of the residents concerned was made in only a few cases, because the local health officer did not grasp the situation. Several of the Ludlow physicians appealed to the Cincinnati Board of Health for relief. On determining the facts Dr. Landis notified the Ludlow authorities he would take measures to quarantine the State of Kentucky from Cincinnati unless the City of Ludlow proceeded to cure itself. In many essentials the people of Cincinnati and those of these adjoining Kentucky municipalities are one. Naturally there was a protest from Kentucky, and the Health Board of Ludlow was descended on by its neighboring cities and villages, and, by pressure of public opinion, Ludlow was made to act promptly. The plan of Dr. Landis was to take possession of the bridges crossing the Ohio at these points, and if necessary to invoke the aid of the state militia through the State Board of Health, in order to accomplish the purposes of this phase of the campaign for health. His maneuver of threatening to quarantine the State of Kentucky from Cincinnati proved to be an admirable bit of strategy.

PENNSYLVANIA

Personal.—Dr. G. F. Bretz, who has been seriously ill at the Pottsville Hospital, has returned and is reported to be convalescent at his home.——Dr. Edward A. McLane, chief resident physician at the Scranton State Hospital, has resigned, to take effect October 31, and will take up private practice in Scranton.

Jewish Sanatorium Dedicated.—The new buildings of the Philadelphia Sanatorium for consumptives at Eaglesville were dedicated October 4. The ceremonies were presided over by Louis Gerstley, president of the institution, and the principal address was made by Dr. Martin G. Brumbaugh, Republican candidate for governor. The new buildings were erected at a cost of $30,000 and will increase the capacity of the institution from 72 to 100 patients.

Philadelphia

General Wood the Guest of Honor.—The Medical Club of Philadelphia gave a reception at the Bellevue-Stratford Hotel, October 16, in honor of Major General Leonard Wood, U. S. Army.

Enforced Vaccination at University.—More than 250 students in the evening school at the University of Pennsylvania have been notified to leave unless they produce certificates showing they have been vaccinated.

To Prevent Defective Hearing.—As nearly 3 per cent. of the children of school age have defective hearing the Department of Public Health and Charities is issuing a bulletin urging parents to carry out the instructions of school medical inspectors when they report that a child has defective hearing.

War Zone Scenes Narrated.—A meeting of the Philadelphia Clinical Association, October 5 was devoted to the "War Victim Social Evening," in which Drs. James C. Anders, Edward E. Montgomery, Henry W. Cattell and Wendell Reber detailed their experiences in Europe since the outbreak of the war.

Moving Pictures for the County Society.—The possibility of moving pictures as an aid to diagnosis and investigation of disease was demonstrated at a meeting of the Philadelphia County Medical Society at the Academy of Natural Sciences, October 14. Views of patients and of microscopic life, truly representing objective symptoms of several diseases, were shown.

Philadelphia Hospital Modernization Assured.—The inclusion of an item for one million dollars for improvement of Philadelphia General Hospital, in the new loan bill for $11,500,000 just passed by councils and signed by the mayor, means the definite and early change of the city's great charity into one of the world's models for treatment and teaching purposes. At least 3,000 beds are in view for this notable object.

Instructions for Mothers in Street Signs.—Street signs educating mothers in the care of their children and spreading the doctrine of personal and civic hygiene will be adopted as a new educational method by the Child Federation, which held its first annual meeting at the Bellevue-Stratford. As it is difficult for the mother sitting on her doorstep to be reached by boards of health and private agencies, it is planned to place 300 iron frames in conspicuous places in back alleys and courts of the city. Signs will be printed to fit in these frames that will deal with health topics and give seasonal warning to mothers.

Typhoid in South Philadelphia Due to Political Greed.—Because the political machine values a few petty jobs more than the health of a residential section, South Philadelphia is forced to live in conditions which breed typhoid fever cases. According to the report of Chief Davis of the Water Bureau, since January 1 there have been 208 cases of typhoid fever in downtown wards, 1st, 2d, 3d, 4th, 5th, 7th, 8th, 26th, 30th, 36th, 39th and 48th. In the same period there have been only 309 cases in all the rest of the city. To wipe out the conditions which make this state of affairs possible the legislature was induced to pass a law creating the division of housing and sanitation in the Bureau of Health. The necessary appropriations have been denied by the political machine councilmen, despite the fact that the courts on several occasions have practically ordered councils to act. For more than sixty years private owners in these areas have waited for the city to build sewers. They have paid taxes on these unsewered properties only to see city councils appropriate funds for improvements in undeveloped areas.

SOUTH CAROLINA

Malaria and Pellagra Made Reportable.—The Greenville board of health has decided to place malaria and pellagra among reportable diseases.

Banquet to New York Philanthropist.—The Spartanburg County Medical Society and citizens of Spartanburg gave a buffet supper, September 22, in honor of Col. Robert M. Thompson, New York City, of the Thompson-McFadden Pellagra Commission, the principal contributor to the maintenance of the commission.

Infant Mortality Should be Reduced.—The most recent bulletin issued by the Committee on Health and Public Inspection of the South Carolina Medical Association, deals with infant mortality and the ways and means of reducing the excessive death-rate of infants under 1 year of age.

Medical Examination of Schoolchildren.—The superintendent of schools at Aberdeen has been authorized to have all children medically examined before admission to school. Those who wish may be examined by their family physicians, or they may be examined free at the schools. No child will be admitted without examination.

UTAH

Personal.—Dr. Abraham Fernlund, Ogden, has recovered from his recent severe illness.——Dr. Ernest D. Hammond, Salt Lake City, has been elected president of the Utah Baptist Association.

New State Officers.—At the twentieth annual meeting of the Utah State Medical Association held in Salt Lake City, September 29 and 30, the following officers were elected: president, Dr. Robert S. Joyce, Ogden; vice-presidents, Drs. John W. Aird, Provo; Edward L. Rich, Ogden, and Lashbrook B. Laker, Eureka; secretary, William Brown Ewing, Salt Lake City (reelected); treasurer, Howard P. Kirtley, Salt Lake City (reelected), and councilors, Dr. Eugene H. Smith, Ogden, first district, and Dr. Thomas C. Gibson, Salt Lake City, second district. Salt Lake City was chosen as the meeting-place for 1915.

WISCONSIN

Home from Abroad.—Dr. and Mrs. Frank J. Wochos, Kewaunee; Dr. Wm. Weber Kelly, Dr. Richard C. Buchanan and James P. Lenfesty, De Pere, have returned from abroad. ——Dr. Mathias A. Lee, Superior, has arrived in London on his way from Vienna.

Women Physicians Elect Officers.—At the annual meeting of the Wisconsin Medical Women's Society held in Oshkosh, October 6 and 7, the following officers were elected: president, Dr. Carrie A. Frost, Chippewa Falls; vice-president, Dr. Mary Houck, LaCrosse; secretary, Dr. Helen A. Binnie, Poynette; and treasurer, Dr. Maude F. Pratt, Appleton.

Advocates Free Dispensaries. — Health Commissioner George C. Ruhland of Milwaukee is planning to establish a series of free public dispensaries in the school buildings of the city where citizens may take physical examinations annually or at frequent intervals. The purpose of these dispensaries is to protect the public health by detecting physical illness in its incipient stages.

Sanatorium Notes.—Work on the construction of the Winnebago County Sanatorium, Oshkosh, is advancing so rapidly that it is expected that the institution will be in readiness for occupancy early in February.——Dr. John W. Coon, superintendent of the State Sanatorium, Wales, in his annual report, asks for new buildings and other expenditures which will enable the state to expand the work of the institution to the needed scope.

State Society Meeting.—At the annual meeting of the State Medical Society of Wisconsin held in Oshkosh October 7 to 9, the following officers were elected: president, Dr. Theodose J. Redelings, Marinette; vice-presidents, Drs. Hoyt E. Dearholt, Milwaukee; Spencer D. Beebe, Sparta, and Henry W. Morgenroth, Oshkosh; delegates to the American Medical Association, Drs. Alfred H. Levings, Milwaukee, and John F. Pember, Janesville; and committee on public policy and legislation, Dr. Joseph P. McMahon, Milwaukee; Charles S. Sheldon, Madison, and John J. McGovern, Milwaukee.

Personal.—Dr. Samuel D. Huntington, Milwaukee, who stabbed himself in the breast with a scalpel recently, is reported to be improving.——Dr. William W. Witcpalek, Collins, recently underwent an operation at Manitowoc.——Dr. Frank A. McJunkin, successor to Dr. A. F. Boretti, deceased, as director of pathology and bacteriology of the Marquette University School of Medicine, has arrived from Boston and assumed the duties of his position.——Dr. Michael A. Cunningham, Janesville, is reported to be ill with diphtheria.

CANADA

Toronto Academy of Medicine.—The first open meeting of the Academy of Medicine, Toronto, for the season 1914-1915, was held October 6, when Dr. Harry B. Anderson delivered the annual presidential address and Dr. Lewis Gregory Cole of New York City, gave a most interesting and instructing paper on "Roentgenologic Diagnosis of Lesions of the Gastro-Intestinal Tract," illustrated with lantern slides and cinematographic demonstrations.

Checking Pollution of the Great Lakes.—The International Waterways Commission is holding a sitting in Ottawa and is dealing with the levels of the Lake of the Woods and the pollution of international waters. As the source and extent

of this pollution was investigated some time ago, from municipalities and steamers, the meeting is to determine a remedy. This will then be submitted to the United States and Canadian governments.

Ontario to Regulate Slaughter-Houses.—The Provincial Health Board of Ontario is bringing all rural and municipal slaughter houses under strict regulation and inspection. Hereafter before any one can construct a slaughter-house in Ontario the plans and specifications must be approved by the Board of Health. The board is determined to stop the handling of meat by dirty employees. No person affected with tuberculosis or other communicable disease will be permitted to be employed at or in any department where meat is handled.

Quebec Physicians Contribute to Patriotic Fund.—The College of Physicians and Surgeons of the province of Quebec at its recent meeting donated $1,000 to the Canadian Patriotic Fund. It also decided to allow final students in medicine going to the war, exemption from study during such period. Dr. Art A. Simard, Quebec, was elected president, and Dr. Henri A. LaFluer, Montreal, first vice-president. Notice was given of motion to reduce the number of representatives from 41 to 21 and this will be brought up at the next regular meeting.

Personal.—Dr. John George Adami, Montreal, has enlisted as a private in the McGill University Battalion.——Majors Edward A. LeBel and Robert P. Wright and Captains Conrad G. Geggie and Robert Mayrand, Quebec, have volunteered for service in Europe.——Sir Edward S. Worthington, R.A.M.C., surgeon and medical aide to the Duke of Connaught, the Governor General of Canada, has started for England.——Dr. Andrew A. Fletcher has arrived at Toronto from Germany.——Dr. G. B. Archer, medical missionary from India, is in Toronto.——Dr. O. R. Avison, formerly of Toronto, but for several years a medical missionary in Korea where he superintends a large hospital, is visiting in Toronto.——Dr. William H. Ellis, for many years chemical expert for the Ontario Government, has been appointed Dean of the School of Practical Science at Toronto University.——The Hon. Dr. William J. Roche, Minister of the Interior for Canada, has returned from Rochester, Minn., much improved in health.

GENERAL

Heiser Returned to the Orient.—Surgeon Victor G. Heiser, U.S.P.H.S. Health Commissioner of the Phillipine Islands, who has been on leave in the United States for several months, has returned to his former field of duty at Manila.

Eye, Ear and Throat Specialists Meeting.—The nineteenth annual meeting of the American Academy of Ophthalmology and Oto-Laryngology will be held in the Hotel Copley-Plaza, Boston, October 19 to 31, under the presidency of Dr. James M. Ray, Louisville, Ky.

Railway Surgeons' Meetings.—The Association of Seaboard Airline Railway Surgeons will hold its annual meeting in Petersburg, Va., October 19 to 21 under the presidency of Dr. Hampden Aulick Burke, Petersburg, Va.——The New York and New England Association of Railway Surgeons will hold its twenty-fourth annual session at the Hotel Astor, New York City, October 21, under the presidency of Dr. Clifford A. Pease, Burlington, Vt.

District Association Meeting.—The Iowa and Illinois Central District Medical Association held a meeting in the Outing Club, Davenport, Ia., October 5, at which Dr. William J. Mayo, Rochester, Minn., delivered an address on "Cancer and Its Cure," and Dr. Richard H. Hart, Philadelphia, discussed the "Relation of the Milk Supply of Cities to Tuberculosis."

Plague Situation.—Since the report made in THE JOURNAL of October 10, one case of human plague has been discovered, number 30, Ching You, address, 1054 Baronne Street, male, chinese, aged 51, was taken to Isolation Hospital October 4 at 2 a. m., and died four hours later, right femoral bubo. This makes nine human deaths in New Orleans up to October 4. Rodent cases, numbers 178 to 181, are also reported.

London Heart Specialist Lectures in America.—Dr. Thomas Lewis, assistant physician and lecturer on cardiac pathology in University College Hospital Medical School, London, editor of *Heart* and leader in the newer methods of studying cardiac functions, delivered the eighth course of lectures under the Herter Foundation at Johns Hopkins University, Baltimore. On October 6 he discussed "Observations Exemplifying Electrocardiography"; on October 8, "The Relation of Auricular Systole to Heart Sounds and Murmurs," and on October 9, "Observations on Dyspnea with Especial Reference to Acidosis."——On October 12, Dr. Lewis addressed the Section of General Medicine of the College of Physicians of Philadelphia on the subject of "Heart Sounds."——Dr. Lewis expects to spend the week beginning October 25 at the Peter Bent Brigham Hospital, Boston, as visiting physician *pro tem* to that institution. He will also act as visiting lecturer in medicine at Harvard Medical School and will conduct ward visits, clinics and other student exercises. This is a part of the Harvard plan of having prominent medical men from other cities or abroad as visiting lecturers and temporarily in charge of the wards of the Peter Bent Brigham Hospital, a plan similar to that inaugurated last year by Dr. William S. Thayer at Johns Hopkins Hospital, Baltimore.

Bequests and Donations.—The following bequests and donations have recently been announced:

Philadelphia Blind Asylum and Asylum for the Aged in Germantown, each one-half of the estate of $63,000 contingent on the death of certain relatives, by the will of Kate Worley.

St. Luke's Hospital, New York City, $50,000; Association for Improving the Condition of the Poor; Charity Organization Society and House of Rest for Consumptives, each $10,000, by the will of Herman C. von Post.

New York Skin and Cancer Hospital, $5,000; State Charities Aid Association, $8,500 by the will of Florence Phillips.

New York Foundling Hospital, $5,000 by the will of Rosina M. Nagle.

St. Luke's Hospital and Roosevelt Hospital, New York City, each $79,440, and after the death of beneficiaries the principle to go to the Society for the Ruptured and Crippled, by the will of Frank J. Ransom.

Presbyterian Hospital, Philadelphia, $50,000; Ladies' Aid Society of the Presbyterian Hospital, $5,000; Home of the Merciful Savior, $5,000 by the will of Jane McKee Norris.

Children's Hospital, Philadelphia, $2,000 by the will of Lucy Jones.

Columbia University, New York City, donations of $2,500 for the surgical research fund, by Clarence Mackey; $2,000 by Prof. Frederick S. and Mrs. Lee for the department of physiology; $2,000 to be added to the Frank Hartley scholarship fund in the College of Physicians and Surgeons, by an anonymous donor.

Faulkner Hospital, Jamaica Plain, Mass., $20,000 for the endowment of a bed in the name of the testatrix's father, Thomas B. Proctor, by the will of Mary P. Proctor.

Boston University School of Medicine, donation of $100,000 for the establishment of a Maternity Hospital.

WAR NOTES

Radiographic Service Established.—Madame Curie has established in the Pantin Hospital at her own expense, a radiographic service.

Ambulance Donated.—The Autocar Company of Ardmore, Pa., has donated an ambulance to the American National Red Cross for foreign war service.

French Wounded Rushed to South of France.—The stream of wounded from the battle-fields of the Aisne and Marne are not held in Paris, but are sent to the base hospitals in the south of France.

Russia Needs Medical Supplies.—Victor C. Lassen, an American resident of Petrograd, has returned to the United States to purchase medical supplies and instruments for the Russian government.

Few Wounded.—Of the eight thousand patients in Netley Hospital only about one hundred have gunshot wounds and few of these wounds have been caused by rifle bullets, most of them having been due to shrapnel.

Osler to the Front.—Sir William Osler, formerly dean of the Medical School of Johns Hopkins Hospital, Baltimore, and now Regius Professor of Medicine at Oxford University, has been appointed a colonel in the medical corps of the British army, and has been placed in charge of the hospital service at the front.

Patriotic Physicians of England.—In many places in England the medical men have held meetings and adopted resolutions undertaking to safeguard the interests of their professional colleagues who are called on to leave their practices in the service of their country and also agreeing to take up the medical duties of their associates for the sole benefit of the absentees.

Prophylaxis of Epidemics in Eastern Austria.—Two expeditions have recently been sent to Dalmatia to direct a campaign of prevention against epidemic diseases. One is in charge of A. Ghon, professor of pathologic anatomy at the Prague university; the other is in charge of O. Bail of the chair of hygiene.

The Wounded at Munich.—The first big consignment of wounded came into Munich on the night of August 20-21, consisting of men from the engagements at Mülhausen and Lagarde. Most of the wounds were slight injuries of the

soft parts or long bones. They were found well bandaged and in good condition, showing the excellent status of first aid at the front at that time.

Gold Medals Presented to Germans by British Societies Melted Up for Relief Work.—Roentgen, Lenard and Behring have each recently repudiated the gold medals conferred on them by scientific associations in Great Britain, and have donated them to the Red Cross or other relief work, and now the Hanbury medal, representing a value of about $125, has likewise been donated for relief work by its recipient, E. Schmidt, professor of pharmacology at Marburg.

Navy Medical Organization.—The Royal Navy of England is said to be fully mobilized and the medical officers of the Royal Navy Volunteer Reserve have been called on for service. This reserve consists of civilian practitioners who have been trained in time of peace in the special work of navy surgeons and many of these are now on duty at the navy hospitals on shore and as surgeons on the war ships at sea.

No More "Appendicitis", Etc., in Germany or Austria.—A campaign of extermination is being urged by German-speaking scientists against all words of English, French or Russian origin. If no German equivalent is available, the Greek and Latin root term is to be used. The *München. med. Wchnschr.* comments on the difficulty of always finding an exact equivalent, and proposes that a committee should be appointed to draw up a list of acceptable German equivalents for the more common terms.

Red Cross Appeals for Funds.—The American National Red Cross reports that the returns from the Peace Sunday collections are disappointingly small and urges that liberal responses be made to the appeal for help.——Through the generosity of the Russian-American Steamship Line, the American National Red Cross has been afforded the opportunity to send three thousand pounds of bandages and one hundred stretchers to Russia without transportation charges, by the steamer *Dwinsk*, which sails for Archangel, October 13.

Physicians Appointed on Austrian Army Medical Staff.—The professors of hygiene at the universities of Vienna, Cracow and Lemberg, Schattenfroh, Bujwid and Kutchera, and also K. Büdinger, professor of surgery at Vienna, have been appointed consultants on the chief medical staff of the Austrian army. Other members of the various university medical faculties have been appointed regimental surgeons, including A. Klein, W. Zweig, O. Porges, v. Jagic, F. Wechsberg and A. Herz, all of the internal-medicine teaching force; A. Pilcz and E. Stransky, neurology; Ranzi and Leischner, surgery; and K. Sternberg, W. Pick, Cristofoletti and J. Tandler.

Notes on French Medical Service.—The Paris Academy of Medicine has received from Prof. Edmund Delorme a report on the condition of the French ambulance and sanitary service. Dr. Delorme believes that the service should attempt to treat more wounded, especially those suffering from shrapnel wounds, in order to prevent gangrene and tetanus. For the latter he suggests preventive injections of oxygen, water and antitetanic serum. Dr. A. Dastre gave details of the successful use of a powerful electromagnet for the extraction of splinters of steel and even of rifle bullets. The use of specially prepared paper underclothing to prevent cold was also advised.

Disposition of Red Cross Units.—The Red Cross units transported to Europe on the American Hospital Ship *Red Cross* have been disposed of as follows: Two units, each consisting of three surgeons and twelve nurses with equipment, will be sent to the German, British, French and Austrian armies.——One unit will be sent to Saloniki to join the Servian army.——Belgium has declined the service of surgeons and nurses, but has accepted the medical supplies which will be forwarded from Rotterdam.——It is reported that one or more Red Cross units may be placed on board the English hospital ship which transfers sick and wounded men from the continent to the base hospitals in England and that one unit may be assigned to duty at the American Women's Hospital near Torquay.

A New Missile.—Surgeon Johannes Volkmann (*München. med. Wchnschr.*, Sept. 15, 1914) reports thirteen cases of punctured wounds from arrows dropped from an aeroplane on September 1. The missiles were 10-15 cm. long, of pressed steel, about 8 mm. thick and weighing 16 gr. The lower part was solid, terminating in a needle point. The upper part of the arrow consisting of a skeletal arrangement of 4 thin staves, the whole making a star-shaped figure in cross section. The men of the regiment were surprised lying down by sharp sudden wounds suggesting to some that they had been prodded by one of their comrades as a practical joke. The arrows penetrated arms, feet, calves, fingers, ankles, the cheek, the neck, and in one case, the skull, the latter furnishing the only fatality. In some cases the arrows had to be cut out. The treatment consisted in a sterile bandage, and the wounds healed rapidly by first intention. Only one case was treated with tincture of iodine.

LONDON LETTER

LONDON, Oct. 2, 1914.

The War

In London we can now see thousands of Belgium peasants who have been driven from their homes. The hospitality of this country has been given to these victims by the government. They are accommodated in various parts of the metropolis in poorhouses and in the spacious glass building known as the Alexandra Palace. They can be seen walking about still dazed by the horrors they have witnessed. Most of them come from Antwerp, where they had sought refuge from their burning homes. They are medically examined to see that they are free from infectious disease and put on a British ship. Many of them are of such primitive habits that they have to be taught the use of the bath and the water-closet.

An English citizen recently returned expected to find nothing but terror and distress, whereas if it were not for the newspapers, the wounded, and the thousands of prisoners and refugees coming here, we should not know we were at war. Prices are normal, theaters are open, business goes on just as usual, as do also social affairs, and there seems to be less distress and unemployment than for years past.

As stated in my previous letters, arrangements have been made all over the country for the reception and treatment of the wounded from this titanic war and appear to be working without a hitch. The wounded are conveyed as rapidly as possible from the front to the base hospitals in France on the coast, whence they are conveyed by hospital ships to Southampton, where there is a special staff for their reception and distribution. The arrangements are under the control of a surgeon-general, who holds the appointment of a deputy director of medical service. He has at his command twelve ambulance trains specially constructed for the conveyance of four officers and ninety-six men lying down, or for a considerably greater number of patients sitting up. Twice weekly telegrams are received by him from all the larger military and territorial force general hospitals, stating the number of beds vacant in each. With this information before him he arranges convoys of sick and wounded on arrival and dispatches them to their destination in one or more of the ambulance trains. Already the sick and wounded from overseas have been comfortably placed under treatment in most of the large military or territorial force hospital centers. At the railway stations of these localities arrangements are made by the military authorities for conveying sick and wounded in motor or other ambulance vehicles from the railway stations to the hospitals. Voluntary aid detachments have already done useful work in connection with this stage of the movements of the sick and wounded, and it is expected that the scope for utilizing voluntary aid in this direction will be extended as its value becomes better known. As the military hospitals get filled up arrangements have been made for transferring sick and wounded from them to various hospitals arranged by voluntary effort. Many schemes have been submitted to the war office, through the British Red Cross, in accordance with field service regulations. At present the opportunity of using private hospitals to any great extent has not arisen, as there are still several thousand beds vacant in the military and territorial force hospitals. There is no doubt, however, that in time private hospitals will be of much use as an overflow, and also when it is necessary to set free a sufficient number of beds for future requirements in the larger military hospitals. When sick and wounded are sufficiently convalescent to be granted sick furlough, advantage is being taken of the many offers of accommodation for them in convalescent homes in different parts of the country. In order to prevent overlapping and to facilitate the means of placing men on sick furlough, so far as possible, in their own counties, a central registry of convalescent homes has been formed. Convalescents who require continued hospital treatment will be sent either to the special home in connection with the hospital from which they are transferred (under the supervision of the medical officer of the hospital) or to one or other of the private hospitals already referred to. In all the hospitals arrangements are made for replenishing any deficiencies in the men's kits and for giving them any additional clothing which it may be

desirable for them to take with them when they go on sick furlough. The hospitals are for this purpose receiving many generous gifts of pajama suits and other articles of clothing. At the end of their sick furlough the men are required to rejoin the depots of their regiments in order to be refitted, until arrangements are made for their rejoining their units, either in this country or abroad. They are provided with railway warrants to enable them to go to convalescent homes and to rejoin at their depots. Arrangements have also been made that they shall receive their pay both while they are in hospital and while they are convalescent.

The New Edition of the British Pharmacopeia

Advance copies of a new edition of the British Pharmacopeia have been sent to the press. There are a number of important modifications. No figures or detailed descriptions of plants yielding official substances are given. The histologic characters of the parts of plants officially recognized are fully described whenever the information is important. In many instances in which drugs of vegetable origin are used in a powdered form, the histologic characters of the powder are given when by chemical testing alone the identity of the article in question could not be certainly determined. Abbreviations of the Latin titles have been adopted in the index. The suggestion that a list of such abbreviations should be appended to the British Pharmacopeia in the interest of international uniformity was made by Dr. Remington, chairman of the United States Pharmacopeial Convention. Similar abbreviations are likely to be adopted in the forthcoming Pharmacopeia of the United States. The metric system has been employed for all pharmaceutical and analytical computations and for the specification of doses, in the expectation that in the near future the system will be generally adopted by British prescribers. As a transitional provision, doses have also been expressed in terms of the imperial system. It has been found desirable to indicate a limit to the proportion of lead or of arsenic permissibly present as an impurity in many pharmacopeial substances. Such limits are noted in the text, while details of the mode of employing the appropriate quantitative tests are given in an appendix. The same practice has been adopted with respect to many of the methods relating to the determination of acid value, saponification value, iodin value, unsaponifiable matter, esters and alcohols. These methods are given in an appendix, while in the text of the several monographs relating to fixed oils, fats, waxes, resins and volatile oils, only the numbers expressing the appropriate pharmacopeial values are stated. In the present Pharmacopeia the number of crude drugs and of their galenic preparations which are required to contain a definite proportion of the chief active constituent or constituents has been increased, and the official processes for their "assay" have been revised. It has also been found desirable to prepare extracts of belladonna, hyoscyamus, nux vomica and opium in the form of dry powders, of which the alkaloidal strengths are officially defined. In the case of drugs of definite chemical composition there has been a similar extension of the number to which "assay" processes are to be applied, and, in general, the minimum degree of purity required is specified in the definition of the drug. An international conference respecting the unification of the formulas for potent drugs and preparations in the several national pharmacopeias, held at Brussels in 1902, led to the adoption in 1906 by the participating states of a series of recommendations commonly referred to as "the international agreement." These recommendations have necessitated certain changes in the preparation, composition and strength of important galenic compounds containing potent ingredients, with the object of promoting uniformity in the pharmacopeial usage of different countries. They have already been embodied more or less completely in the various national pharmacopeias that have been issued since 1902. The changes in the British Pharmacopeia thereby occasioned are generally slight; they have been indicated in the prefatory tables and in footnotes, while a separate prefatory table gives a list of deviations from the international agreement, with the reasons for departure from the recommendations. The British practice of measuring liquids by volume and solids by weight has been maintained. It is more convenient, both to prescribers and to dispensers, than the continental practice, contemplated in the agreement, of weighing liquids as well as solids. The variations caused by this difference of usage are, however, of no great importance. It is noteworthy that the number of omissions of drugs in this edition vastly exceeds the number of additions, and surprisingly few of the newer synthetic drugs of German origin have received official sanction.

Marriages

Carroll Hampton Morgan, M.D., Briceville, Tenn., to Miss Katherine Elma Lloyd of Coal Creek, Tenn., September 21.

Elijah White Titus, M.D., Washington, D. C., to Miss Julia Dove Beardsley of Charleston, W. Va., September 22.

William Maxwell Empie, M.D., Virginia, Minn., to Miss Lucy Margret Sterne of Ishpeming, Mich., October 5.

Edward John Kempf, M.D., Baltimore, to Helen Dorothy Clarke, M.D., of Longwood, Boston, September 28.

Clarence Michael Schuldt, M.D., Platteville, Wis., to Miss Julia Smith of Madison, Wis., September 23.

Captain Ralph Harvard Goldthwaite, M. C., U. S. A., to Miss Agnes Pruyn of Albany, N. Y., October 10.

Oswald Patrick Goodall, M.D., DeWitt, Iowa, to Miss Harriet Blake of Los Angeles, September 1.

Charles Nelson Race, M.D., Onondaga, Mich., to Miss Edna Griffin of Battle Creek, Mich., recently.

George W. Lang, M.D., Alicia, Pa., to Miss Leta McAlpine of South Brownsville, Pa., September 26.

Walter Charles Hammond, M.D., to Miss Florence May Nieman, both of Chicago, October 3.

Charles Henry Hecker, M.D., St. Louis, to Miss Sula Anderson of Ottawa, Ill., October 1.

Lyman Allen Steffen, M.D., to Miss Erma Edith Hessel, both of Antigo, Wis., September 23.

Herbert William Allen, M.D., to Miss Gertrude Joliffe, both of San Francisco, September 24.

Francis Downing, M.D., Moosup, Conn., to Miss Rose Shea of Boston, September 29.

Francis Augustine Collins, M.D., to Miss Laura Carey, both of Chicago, recently.

Deaths

John Claudius L'Engle, M.D. Medical College of the State of South Carolina, Charleston, 1861; a surgeon in the Confederate service throughout the Civil War; later a physician and druggist of Jacksonville, Fla.; president of the State Bank of Florida; chairman of the Board of Public Works and a member of the city council of Jacksonville; twice a member of the house of representatives from Duval County and senator from the eighteenth district; for many years a member of the board of trustees of St. Luke's Hospital; died at his home in Jacksonville, September 9, aged 73.

John Goodell, M.D. College of Physicians and Surgeons in the City of New York, 1859; once a member of the New Hampshire legislature from Hillsboro County, for twenty years town historian of Hillsboro and for many years a member of the board of health; died at his home in Upper Hillsboro, N. H., about September 13, aged 85.

Daniel Vincent O'Leary, M.D. Albany, N. Y., Medical College, 1866; once president of the Albany County Medical Society; for many years district and city physician of Albany; for seven years a member of the board of public instruction and from 1885 to 1889 postmaster of Albany; died at his home in that city, August 5, aged 70.

Elbert Rowland, M.D. New York Medical College, New York City, 1858; surgeon of U. S. Volunteers during the Civil War; for several terms a member of the Illinois State Legislature and a resident of Olney, Ill.; died at the home of his son in Mt. Carmel, Ill., September 20, from senile debility, aged 82.

Charles William Harrison, M.D. College of Physicians and Surgeons in the City of New York, 1889; of Hidalgo, Tex.; fell down a stairway at a hotel in Brownsville, Tex., September 11 and died from his injuries two days later, aged 52.

Daniel W. Coble, M.D. Jefferson Medical College, 1867; for more than forty years a practitioner of Westerville, Ohio; a veteran of the Civil War; died at his home, September 19, from organic heart disease, aged 73.

William Rice Saltzgaber, M.D. Rush Medical College, 1899; formerly of Knoxville, Tenn., but for eight years a practitioner of Alamogordo, N. Mex.; died at his home, September 9.

Joseph H. Lopez, M.D. Jefferson Medical College, 1876; medical director for many years of Charity Hospital, Philadelphia, and examining physician and chief of staff of St. John's Orphanage and St. Vincent's Home; died at his home in Philadelphia, September 15, from heart disease, aged 68.

Pitts Edwin Howes, M.D. Eclectic Medical Institute, Cincinnati, 1881; once a member of the Massachusetts State Board of Registration and well known as an editor of medical journals of his school of medicine; died at his home in Dorchester, Boston, September 18, aged 61.

William W. Hawk, M.D. College of Physicians and Surgeons, Keokuk, Ia., 1880; for five years mayor of Colfax, Ia., and for two terms a member of the state legislature from Jasper County; died at the home of his daughter in Newton, Ia., September 15, aged 71.

Edward Wood Markwell, M.D. Indiana University, Bloomington and Indianapolis, 1914; an intern in the Indianapolis City Hospital; died in that institution September 22, from septicemia eleven days after an operation for removal of the tonsils, aged 28.

John Franklin Mackley, M.D. College of Physicians and Surgeons, Baltimore, 1882; a clergyman of the Reformed Church; and secretary of the board of health of Fairfield, Pa.; died at his home in that place, September 16, from heart disease, aged 59.

Oscar Lamar Holmes, M.D. Atlanta College of Physicians and Surgeons, 1899; of Covington, Ga.; a Fellow of the American Medical Association; aged 38; was killed by the explosion of a boiler at a saw mill near Covington, September 23.

Jennie Mary Turner, M.D. University of Michigan, Ann Arbor, 1879; for thirty years a practitioner of Newark, N. Y.; a member of the Medical Society of the State of New York; died in the Rochester, N. Y., General Hospital, September 17, aged 63.

Horatio Roy Luckey, M.D. Indiana Medical College, 1906; of Seymour, Ind.; a Fellow of the American Medical Association; died in the Schneck Memorial Hospital, Seymour, Ind., September 23, a week after an operation for appendicitis, aged 33.

William Frisbie, M.D. New York University, New York City, 1860; a veteran of the Civil War and for half a century a practitioner of Mankato, Minn.; died in the hospital of the Minnesota Soldiers' Home, Minneapolis, September 15, aged 79.

Hal F. Bishop, M.D. University of Wooster, Cleveland, Ohio, 1898; formerly of Lakewood, Ohio; died at his office in Akron, Ohio, September 23, from the effects of poison believed to have been self-administered with suicidal intent, aged 39.

Richard A. Bailey (license Miss., 1882), for many years a practitioner of Crawford, Miss.; aged 73; died at the home of his sister in Gore, Ga., September 4, from the effects of accidental burns received by the explosion of a kerosene lamp.

Herman B. Mohr, M.D. University of Alabama, Mobile, 1891; former chief clerk of the State Board of Health of Alabama, Montgomery; died in a hospital in Birmingham, Ala., September 19, after a surgical operation, aged 56.

George Ivison Ross (license, Massachusetts, 1894) for thirty-eight years a practitioner, and for thirty years a physician of Canton, Mass.; died at the home of his daughter in that city, September 14, from heart disease, aged 67.

Raymond Benjamin Coonley, M.D. New York Homeopathic Medical College, New York City, 1911; of Detroit, Mich; died in Grace Hospital in that city, September 19, from septicemia, due to an infected wound of the lip, aged 25.

William Perry Markland (license, years of practice, Illinois, 1878); a veteran of the Civil War and for nearly half a century a practitioner of Cuba, Ill.; died at his home September 13, from intestinal obstruction, aged 83.

William H. Annowski, M.D. University of Buffalo, N. Y., 1893; of Buffalo; for thirty-five years an official of the police department of the city; died on his yacht near Crystal Beach, Ont., August 1, from cerebral hemorrhage, aged 61.

Harry J. Huber, M.D. Jefferson Medical College, 1909; a Fellow of the American Medical Association and a member of the Ephrata, Pa., Borough Council; died at his home in Ephrata, September 22, from nephritis, aged 31.

George Harkness Payne, M.D. Boston University School of Medicine, 1875; a member of the Massachusetts Surgical and Gynecological Society; of Salem, Mass.; died in Medford, Mass., August 5, aged 73.

Stanley Forbes Duncan, M.D. Tuft's College Medical School, Boston, 1912; later house physician of the Malden, Mass., Hospital; died at his home in Quincy, Mass., September 23, aged 27.

Robert W. Eanes, M.D. Washington University School of Medicine, Baltimore, 1870; a Confederate veteran; died at his home in Eanes Cross Roads, Va., September 19, from nephritis, aged 68.

Louis O. Carson, M.D. Indiana Medical College, Indianapolis, 1877; a member of the Indiana State Medical Association; died at his home in Indianapolis, August, 21, from tuberculosis, aged 61.

John G. Albers, M.D. Cincinnati College of Medicine and Surgery, 1871; a member of the Ohio State Medical Association; died at his home in Fulda, Caldwell, Ohio, September 18, aged 78.

Leigh Seward Krake, M.D. Johns Hopkins University, Baltimore, 1914; of Plainview, Neb.; died in Johns Hopkins Hospital, Baltimore, July 9, from gangrene of the lung, aged 28.

Robert Briggs, M.D. Rush Medical College, 1869; Bellevue Hospital Medical College, 1875; of Clayton, Ill.; died in the Jacksonville State Hospital, September 16, from exhaustion, aged 67.

Bernard Clausen, M.D. New York Homeopathic Medical College, New York City, 1888; formerly of Hoboken, N. J.; died at his home in Binghamton, N. Y., September 24, aged 50.

William C. Ransom, M.D. Vanderbilt University, Nashville, Tenn., 1877; a member of the Tennessee State Medical Association; died in his home in Lewisburg, Tenn., August 2.

Charles C. L. Rudicil, M.D. Atlanta, Ga., Medical College, 1888; a member of the Medical Association of Georgia; died at his home in Chickamauga, Ga., August 14, aged 48.

Charles P. Garland, M.D. Hospital College of Medicine, Louisville, 1891; of Rock Island, Va.; died recently in the Tucker Sanatorium, Richmond, Va.; from pellagra, aged 47.

John Robinson Rutherford, M.D. Victoria, Cobourg, Ont., 1858; of Aurora, Ont.; died at the home of his daughter in Windsor, Ont., September 23, from pneumonia, aged 74.

L. G. Danner (license, Tenn., 1889); a Confederate veteran and for about forty-five years a practitioner of Milan, Tenn.; died at his home in Barton, Fla., September 10, aged 69.

Dennis Cuddahy, M.D. Fort Wayne, Ind., College of Medicine, 1902; of South Bend, Ind.; died in St. Joseph's Hospital in that city, September 26, from diabetes, aged 53.

Arthur Lee Heglar, M.D. Tennessee Medical College, Knoxville, 1895; of St. John, Wash.; died in St. Luke's Hospital, Spokane, August 17, from septicemia, aged 44.

J. H. Bell, M.D. McGill University, Montreal, 1888; for fifteen years a surgeon on steamers of the White Star Line; died in Liverpool, England, September 15, aged 49.

Samuel Buzzard, M.D. Philadelphia University of Medicine and Surgery, 1871; of Russell, Ia.; died in the Methodist Hospital, Des Moines, Ia., September 16, aged 74.

Louis C. Pappa (license, Ohio, 1897) a practitioner of Ohio for forty-eight years; died at his home in Youngstown, September 23, from heart disease, aged 83.

Myron H. Parmelee, M.D. Hahnemann Medical College, Chicago, 1870; a veteran of the Civil War; died at his home in Toledo, September 22, aged 65.

George James Gladman, M.D. McGill University, Montreal, 1886; died at his home in New York City, October 13, from cerebral hemorrhage, aged 50.

Adam Eddmon, M.D. Friedrichs University, Halle, Germany, 1867; died at his home in Tontogany, Ohio, September 16, from septicemia, aged 65.

Charles Mariner Coolidge, M.D. Dartmouth Medical School, Hanover, N. H., 1888; died at his home in North Waterford, Maine, August 12, aged 50.

Joseph Mosher Heller, M.D. Rush Medical College, 1877; died at his home in Osage City, Kan., September 19, from heart disease, aged 61.

A. E. Currier (license, Kansas, seven years' practice, 1901); for many years a resident of Fort Scott; died at his home, September 19, aged 80.

Constantine Lomax Dickens, M.D. Rush Medical College, 1879; died at his home in LaFontaine, Ind., August 19, from heart disease, aged 58.

Julia Agnes Milmoe, M.D. Syracuse, N. Y., University, 1912; died at her home in Nyando, N. Y., August 8, aged 35.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

"PROFESSOR" SAMUELS AGAIN

Denied the Use of the Mails and Convicted of Fraud in the United States Court

Many readers of THE JOURNAL will remember the exposés[1] of "Professor" Samuels of Wichita, Kan. Briefly, Samuels was a mail-order medical faker, who advertised to cure practically all disease by means of a wonderful liquid that he had discovered, which was administered by dropping it into the eye of the afflicted person. His marvelous liquid was analyzed by the Association's chemists and found to consist essentially of a little common salt and sugar dissolved in hydrant water. The Samuels fraud flourished and the faker himself waxed rich. Probably because he thought he could carry on his operations on a more extensive scale in a larger city than Wichita, he moved his fakery to Detroit. This change of base was called attention to editorially in THE JOURNAL.[2] The public prosecutor of Detroit immediately "got busy," raided the Samuels concern, seized the quack's card-index of present and prospective victims and carried off a barrel of sugar and a bin of salt. Finding Michigan so unsympathetic, Samuels went back to his old stamping ground in Wichita and continued to fleece the sick as before.

On March 28, 1914, a memorandum, charging that "Professor" H. Samuels and the Professor H. Samuels Remedy Company, both of Wichita, Kan., were violating the postal laws in that they were obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, was delivered to both Samuels and his company. They were further called on to show cause, on or before April 10, 1914, why a fraud order should not be issued. A continuance was granted, at the request of Samuels, until April 30, 1914, at which time Amos W. Marston, a Chicago attorney, appeared before the government officials on behalf of the Samuels fakery. At the conclusion of the hearing, the attorney was given, at his request, until May 16 for the filing of a brief. When the brief was received by the federal authorities it was given careful consideration, and after a thorough examination of all the evidence in the case, Assistant Attorney-General Lamar recommended the issuance of a fraud order. On June 1, 1914, a fraud order was issued.

The government's investigation brought forth but few additional facts to those published in THE JOURNAL. The government chemists found, as did the chemists of the Laboratory of the American Medical Association, that the preparation sold by Samuels was essentially a pinch of sugar and a pinch of salt in ordinary hydrant water. The postoffice inspectors wrote to the Samuels concern under various names and received at different times letters representing that the Samuels remedy would cure bow-legs, flat-foot, sprained ankle, epileptic fits and lack of weight. Speaking of the Samuels nostrum, the Assistant Attorney-General says:

> "The claims for this solution, when considered in connection with its analysis, are palpably fraudulent, and it is clear that no one could be induced to purchase it if its real composition were revealed. Hence it is described as a new, peculiar and secret remedy in the advertising matter; and its real character fraudulently concealed. The analysis shows that there is nothing new, peculiar or secret about this solution and I so find."

An investigation was also made by the federal authorities of one case described in Samuels' testimonials. This particular testimonial, which has been used by the quack for some years, was to the effect that Samuels had cured an old character known as "Blind Joe" of Topeka, Kan. According to the claims made by Samuels, "Blind Joe" had been sightless for several years and "had exhausted all of the means in his power to be cured," had given up in despair until he "fell into the hands of Professor Samuels." Then: "In a short time he was able to see practically as well as he ever had in his life." The federal authorities interviewed the father and sister of "Blind Joe," both of whom swore that "Blind Joe" was blind; was never cured by "Professor" Samuels but died blind, and they declared further that the representations made by Samuels were absolutely false.

It was shown further at the trial that "Professor" Samuels was not, in fact, a professor at all. In March, 1914, Samuels was sued by a woman who was suffering with cataract and had taken Samuels' "treatment" without success. She was awarded $400 damages against this faker. At the trial Samuels admitted, under oath, on the witness stand, that he was not a scientist or a physician, that he had not read any medical or scientific books on diseases of the eye for twenty years; that he was not competent to testify whether the woman had a cataract or not and that he had treated her without examination.

In addition to being debarred from the use of the United States mails, Samuels was indicted by the federal grand jury and put under $20,000 bonds for appearance in the United States court. This trial has just been completed and Samuels was found guilty in the federal court at Wichita on eleven counts of using the United States Mails to defraud; the maximum penalty for each one of the eleven counts is a fine of $1,000 and five years in prison. It is to be hoped that this cruel and heartless swindler will be given a penitentiary sentence.

CONVICTIONS UNDER FOOD AND DRUGS ACT

NURITO

Nurito was exposed in THE JOURNAL, Aug. 10, 1912. It was analyzed by the Association's chemists and found to consist of milk sugar, phenolphthalein and pyramidon. THE JOURNAL'S article called attention at the time to the falsity of some of the claims made by the Magistral Chemical Company of New York, the manufacturers of Nurito. One statement made was that "Only U. S. P. ingredients are used in Nurito." As neither of the two essential drugs in this nostrum, phenolphthalein and pyramidon, is in the United States Pharmacopeia, this claim was evidently false.

On June 17, 1913, United States officials charged the Magistral Chemical Company with shipping in interstate commerce a product, Nurito, that was misbranded in violation of the Food and Drugs Act. This charge was made on the grounds that the following statements on the label were false:

> "Only U. S. P. ingredients are used in Nurito . . ."
> "Nurito is absolutely free from sugar and sweetening matter."

The government chemists analyzed the stuff and found that Nurito contained both pyramidon and milk sugar, the former a drug that is not in the United States Pharmacopeia and the latter a sugar and sweetening matter. On July 1, 1913, the company pleaded guilty and the court suspended sentence. The report of the case was issued Aug. 3, 1914.—[*Notice of Judgment, 2997.*]

RADAM'S MICROBE KILLER

This wretched fraud has been repeatedly exposed and has twice been declared misbranded under the Food and Drugs Act (Notices of Judgment, 205 and 623). It is interesting to note that the first two cases against this fraud were quickly decided. In the first instance twelve cases of Radam's Microbe Killer were seized, and the makers did not appear in defense of the suit. The court ordered the stuff destroyed by the United States marshal. In the second case, the Radam Microbe Killer Company pleaded guilty and twenty-five cases of the nostrum were destroyed. Both of these cases against Radam's Microbe Killer came before the Supreme Court's decision on the Food and Drugs Act which held

1. Reprinted in "Nostrums and Quackery"; also in pamphlet (price 4 cents).
2. "What's the Matter with Michigan?" THE JOURNAL A. M. A., March 23, 1912, p. 863.

that, as originally passed, the law did not refer to curative claims when it prohibited "any statement . . . which shall be false or misleading in any particular. . . ." This decision, it will be remembered, so seriously weakened the law as to call forth a presidential message urging an amendment that would specifically fill the gap discovered by the Supreme Court. The Shirley amendment was the result. This declares that a product shall be considered misbranded "if its package or label shall bear or contain any statement, design or device regarding the curative or therapeutic effect of such article, or any of the ingredients or substances contained therein, which is false and fraudulent."

The latest conviction against Radam's Microbe Killer was brought on the charge that the claims for the curative effect of the nostrum were "false and fraudulent." The government officials declared that the claim made for the stuff that it would destroy microbes in the human system was false; that the claims that it was "harmless," was a "tonic," was "antiseptic" and a "digestive," were false; that the claim that it was "food for the blood" was false; and that the claim that it was effective in the treatment of consumption, cancer, catarrh, yellow fever, leprosy, diphtheria and small-pox, was also false.

In this instance, the claimant, D. W. Ham of Minneapolis, fought the case in the courts. The matter came to trial before an intelligent jury whose understanding of the case was not befogged by the specious arguments of those who were defending the fraud. The jury returned a verdict in favor of the government's contention that the stuff was falsely and fraudulently misbranded and the court adjuged it condemned and forfeited, and ordered the stuff destroyed by the United States marshal.—[*Notice of Judgment, 3004.*]

DR. HILTON'S SPECIFIC NO. 3

Dr. Hilton's Specific No. 3 is said to be prepared by G. W. Hilton, M.D., Lowell, Mass. Some of the nostrum was shipped in interstate commerce and the federal authorities charged that the preparation was misbranded in violation of the Food and Drugs Act. Some of the claims made on the label for this stuff were:

"Cures colds, the grippe, and absolutely prevents pneumonia."
"Kills the cold, prevents pneumonia, grippe, bronchitis, and all ills that develop from a cold."
"In Boston where Hilton's No. 3 is almost universally used, it has reduced the death rate from pneumonia more than one-half since 1891."

The stuff was analyzed by the government chemists and found to have "no medicinal properties whatsoever." No claimant appeared for the property and the court entered judgment for condemnation and forfeiture and it was ordered by the court that the product *should be sold by the United States marshal!* The moral and ethical problem involved in the sale by the government of a product of this sort is not discussed in the federal bulletin.—[*Notice of Judgment, 3043.*]

DR. SULLIVAN'S SURE SOLVENT

Dr. Sullivan's Sure Solvent is manufactured by the Dr. Sullivan Sure Solvent Co., Buffalo, N. Y., and St. Catherine's, Ont. A consignment of the preparation, shipped in interstate commerce, was seized by the federal authorities on the charge that it was misbranded under the Food and Drugs Act. The stuff, which contained 9 per cent. alcohol, bore the following claims on the labels and shipping cases:

"Gives the most rapid cure of those suffering from the abusive use of alcoholic beverages."
"Cures all kidney, stomach and liver troubles."
"The only remedy in the world today that positively will cure rheumatism and kidney trouble."
"If a tumor is growing, a cancer developing . . . Sullivan's True Solvent will disperse it for good."

Misbranding was alleged because of the false, misleading and fraudulent statements regarding the curative properties of this nostrum. The company did not appear to defend the suit and judgment of condemnation and forfeiture was entered, the court ordering that the product be destroyed.—[*Notice of Judgment, 3130.*]

WEST BADEN SPRUDEL WATER

West Baden Sprudel Water is bottled by the West Baden Springs Company, West Baden, Ind. The federal authorities filed a libel for seizure and condemnation of twenty-eight cases each containing twenty-four bottles of this "water" that had been shipped in interstate commerce, charging that it was both adulterated and misbranded in violation of the Food and Drugs Act. The product was declared adulterated for the reason that it contained and in part consisted of a "filthy and decomposed animal substance." Misbranding was alleged because the labels on the bottles, etc., were false, misleading and deceptive in that they represented and indicated that West Baden Sprudel Water was a natural spring water without additions or abstractions of any kind. The government chemist declared such was not the fact as sodium sulphate (Glauber's salt) magnesium sulphate (Epsom salt) and sodium chlorid (common salt) had been added to the water. Neither the West Baden Springs Company of West Baden, Ind., nor the firm of Levi and Ottenheimer of Cincinnati, Ohio, in whose possession the shipment was found, appeared to defend the case, although due notice of the proceedings had been given both. The government's charges were upheld by the court and the judge ordered that the product should be destroyed by the United States marshal.—[*Notice of Judgment, 3136.*]

RUSSELL'S WHITE DROPS

The Russell Medicine Company, Providence, R. I., manufactured Russell's White Drops. The nostrum contains, among other things, both alcohol and codein. It was sold under the following claims:

"Warranted to be free from any injurious effects or drug forming habits. . . ."
"A safe and effectual remedy for babies and children teething."
"An invaluable remedy for the relief and cure of wind colic, acidity of the stomach, diarrhea, dysentery, restlessness, etc., in children teething."
"Harmless and effectual."

The label of this "baby killer" admitted the presence of 10 per cent. alcohol and codein ¼ grain to each fluidounce, but the admission was, according to the government's report, in inconspicuous type. Misbranding was alleged for the reason that the true amount of alcohol and codein was not given, the nostrum containing more than 10 per cent. alcohol and a much larger quantity of codein than that admitted on the label. Misbranding was further alleged because of the false and fraudulent claims made on the label of the stuff. No one appeared in defense of this wretched nostrum and the court ordered the stuff destroyed.— [*Notice of Judgment, 3154.*]

Causes of Tuberculosis.—Tuberculosis may be put into three groups. All of us who are here come in the first. If I had an instrument here with which I could look into the chest or the abdomen of each of you, the probability is that in 90 per cent. of you would be found somewhere a small area of tuberculosis. So widespread is the bacillus that practically all humans by the time they become adults harbor the germ of the disease. Why don't you die? Because we are not guinea-pigs or rabbits, we have obtained a certain immunity. But the germ is in us, though negative, and with all of us there is the possibility of slipping into the two other groups. The second group comprises those in whom the disease is active enough to produce symptoms, but in whom there is the possibility of arrest or cure, with restoration to working health. Those in the third group are doomed, the disease progresses week by week, month by month, year by year and from one year to five sees the end. When workers have living wages, when the house becomes the home, when the nation spends on food what it spends on drink, then, instead of hundreds of thousands, there will be millions in the first group, with practically immunity. The enemy has been traced to its very stronghold, which is defended by the three allies poverty, bad housing and drink. —Sir William Osler's address at Leeds Conference for the Prevention of Tuberculosis.

Correspondence

The Twilight Sleep in Obstetrics

To the Editor:—While Krönig and Gauss are engrossed in their military duties, the propaganda for the twilight sleep still goes on in McClure publications. The article in *McClure's* for October is a good example of the fallacious arguments and pictorial intimations that are being pressed on the American public in support of this very doubtful procedure in obstetrics. Pictures of scopolamin-morphin or Freiburg babies adorn several pages of the magazine. They generally represent vigorous children from 3 to 5 years of age as if the vigor depended on the fact that their mothers had received a sixth of a grain of morphin and an indeterminate amount of scopolamin during their birth. One illustration shows a child of 6 born without scopolamin and a sister of 4 granted the blessing of "twilight sleep." The legend reads: "A Freiburg mother and her two children. The older child (at the right) was born in the 'old school' way, and, though 6 years old, is being rapidly outdistanced in physical development by his 4-year-old sister, born under scopolamin." Thus the intimation is continually presented to the reader that scopolamin-morphin has some magic far-reaching influence that changes the physical destiny of the child. The whole question is confused in the reader's mind. The issue is changed from a technical question of the practice of obstetrics to one of sociologic importance. The fallacy that these are selected cases and that there is no reason to suppose that a single dose of a drug given the mother at the time of birth will affect the future of the child is lost sight of. Let us dress up a hundred handsome children whose mothers bore the pangs of labor without any anesthetic (and such could easily be found) and take their pictures and what have we proved? Nothing at all. Even the layman can see the utter futility of trying to decide a question by such evidence.

Again, the facts are not fairly represented in the picture drawn of the course of labor under scopolamin-morphin. The authors note that at a certain period the relatives unostentatiously withdraw. No hint is given of the reason for this precaution. This reason, however, is supplied by Krönig, who says:

"The disadvantages of this method consist in the fact that with some women, especially when the surroundings are not very quiet, transitory states of confusion of mind and excitement occur. These are of no material importance, so long as the relations of the mother do not remain in the room, for these states of excitability make an unpleasant impression on the family. In consequence of this, we only carry out the method of twilight sleep in cases where the relations promise to be out of the room during the whole time of the birth" (*Surgery, Gynecology and Obstetrics*, May, 1914, p. 529).

Is it not time that this misleading popular exploitation of a practically discarded method be met by clear statements from the medical profession through the press? Such statements ought to show that a degree of anesthesia satisfactory to most patients is already achieved in the routine practice of obstetrics; that "twilight sleep" is not absence of pain but abolition of memory; that, as Lequeux says, "the patient is delivered as in a delirium." The psychic influence on the subconscious mind of the pain of labor felt but not remembered in the absence of friends remains for the neurologist to elucidate. J. H. Salisbury, M.D., Wheaton, Ill.

The Duck as an Insect Destroyer

To the Editor:—Corroborating Dr. Dixon's interesting report on "The Duck as a Preventive Against Malaria and Yellow Fever" (The Journal, Oct. 3, 1914, p. 1203), I have been observing the food of the wild duck for the past three years, and find that the mosquito and larvae are readily devoured by the duck. I have eight varieties under observation and note that the best insect destroyers are the beautiful wood duck (*Aix sponsa*) and the green-winged teal (*Nettion carolinensis*). These ducks are smaller than the mallard (*Anas platyrhynchos*) and their diet more insectivorous. The wood duck is almost extinct except in captivity. It is the most beautiful of all the duck family; therefore the introduction of this duck would serve to perpetuate its kind and also be of use in keeping down all noxious aquatic insect life.

William C. Herman, M.D., Cincinnati.

Instructor in Pharmacology, Medical College of the University of Cincinnati.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

POISONING FROM PHENOLAX

To the Editor:—I have just examined a young nurse from Johns Hopkins Hospital for an apparent poisoning of the skin (dermatitis medicamentosa) from "Phenolax." As this is my first observation of poisoning from this drug I write to ask (1) if you have heard of similar cases, and (2) if you can tell me the composition of this drug. The patient is 33 years of age, and, on her three weeks' vacation, had been eating voraciously of fresh vegetables "because they were so good." A mild constipation had developed into a rather marked one and for this reason a friend advised Phenolax, which the patient had never before taken. This was at 11 a. m. (1 pill) September 14. At 4 o'clock p. m. the first skin eruption appeared on the lower abdomen and at 6 o'clock there was a violent movement of the bowels and extreme nausea but no vomiting. At 6:30 the patient felt better but very "wobbly." The skin eruption appeared over larger and larger areas but the subjective symptoms were almost nil. To-day, September 15, at 11:30 there is on the skin over the lower abdomen and down the thighs to the knees (with the exception of a white band at the top of the stockings) and on the right breast a claret-red, mottled but almost homogeneous erythema tending toward purpura. The border is not sharply defined. The temperature is normal and the patient thinks that the eruption has faded a little.

Charles J. White, M.D., Boston.

Answer.—1. We have no record of a similar effect from the taking of phenolphthalein. It is generally believed that the remedy is not absorbed, although albuminuria following its ingestion has been reported. It is quite possible that the eruption observed in this case was due to reflex disturbances of the vasomotor system from intestinal irritation or to the absorption of toxins already present in the intestine when the drug was taken.

2. Phenolax is one of many proprietary phenolphthalein preparations which physicians are asked to prescribe although we know no reason why they should do so, unless it be that they have failed to familiarize themselves with the properties, dose, etc., of phenolphthalein itself (The Journal, April 30, 1910, p. 1458). Phenolax wafers are tablets containing in each, according to their exploiters: phenolphthalein, 1 grain, and "aromatics" and sugar enough to make 5 grains. Just what purpose aromatics and sugar serve we are not informed. We imagine that it is to mislead the unthinking into believing that the combination has some mysterious value that phenolphthalein does not have. It is certain that the combination can be sold at a much better profit than can phenolphthalein alone.

In this connection we again ask, Why should we prescribe phenolphthalein under a proprietary name when we can do so under its own name and without mystifying ourselves? Since phenolphthalein is practically insoluble in water and tasteless, there can be no need for adding aromatics and sugar, especially when it is swallowed in the form of a tablet.

TEST FOR DETERMINING ALCOHOL

To the Editor:—Can you give me a simple test for determining the presence of alcohol in a beverage which looks and smells like port wine, but is claimed to be non-alcoholic?

George Minges, M.D., Dubuque, Iowa.

Answer.—Many tests for alcohol (ethyl, or grain) have been proposed, but most of them are too complex for application in a physician's office. As a general rule liquids to be tested for alcohol should be distilled and the identification tests applied to the distillate. In the absence of other distillation apparatus, one that is satsifactory may be improvised by fitting a 6-inch test-tube with a perforated cork carrying a glass tube bent downward, the lower limb being wrapped

with wet filter paper. Another test-tube may be used to collect the distillate. Ten c.c. of the solution to be tested are placed in the apparatus and cautiously heated with a Bunsen burner or spirit lamp until about 1 c.c. has passed over. Five or six drops of a 10 per cent. solution of sodium hydroxid are added to the cold distillate and just sufficient compound solution of iodin (Lugol's solution) to produce a faint brownish-yellow tint. The solution should be shaken two or three times during an interval of two minutes. No precipitate of iodoform should be produced, indicating absence of acetone and a few other substances which yield iodoform under these conditions. The solution is now warmed to about 60 C. (140 F.), which is about as hot as one can hold in the hand. On shaking the test-tube a pale lemon-yellow precipitate of iodoform should appear within two minutes. To be successful with the test in every case requires a little practice, and it may be found necessary to add a few drops more of the iodin solution if the mixture becomes colorless, or a drop or two more of the alkali solution if the test mixture be too highly colored. If the distillate contains much alcohol it should be diluted with two or three volumes of water before applying the test. Unfortunately there are some substances other than ethyl alcohol which give this test; but in a liquid which is sold as a beverage these substances are not likely to be present in interfering amounts.

USE OF PARAFFIN OIL

To the Editor:—1. Do you regard the continuous administration of paraffin oil over a long period especially liable to cause cancer? A recent report of Dr. H. C. Ross of the British Government Commission for the study of the causes of the frequent occurrence of cancer among paraffin workmen indicates that there are substances in paraffin oil associated with anthracene which may cause cancer, but that these substances are soluble in water and may be removed by washing.

2. Is paraffin oil now obtainable from which these substances have been removed? If so, where?

3. Will you kindly give formula for a satisfactory emulsion of paraffin oil for those unable to take the plain oil?

THOMAS J. TUDER, M.D., Keokee, Va.

ANSWER.—1. The occurrence of cancer from chronic irritation is recognized. If paraffin has any influence in the production of cancer it is probably due to the presence of irritating ingredients. The purified paraffin oil, such as is recommended for medicinal use, is entirely bland and non-irritating. There is no reason to suppose that the continued use of this would cause cancer.

2. A paraffin oil corresponding to the requirements of a bland, non-irritating oil is on sale by dealers in pharmaceutical preparations. This oil may be obtained by prescribing Paraffinum Liquidum or Petrolatum Liquidum, Grave, as described in THE JOURNAL, May 30, 1914, p. 1740.

3. The following is a modification of Emulsio petrolei, British Pharmaceutical Codex, a book corresponding somewhat to our National Formulary:

Liquid paraffin	30.00
Gum acacia, in powder	15.00
Tragacanth, in powder	1.35
Oil of cinnamon	0.20
Elixir of gluside (saccharin)	0.33
Distilled water to make	100.00

Triturate the liquid paraffin and the oil of cinnamon with the powdered gums, and add all at once 25 parts of distilled water; then add the elixir of gluside and dilute with sufficient distilled water to produce the required volume. The dose is from 4 to 15 c.c.

PAPINE, CELERINA AND ALETRIS CORDIAL

To the Editor:—Please tell me the principal ingredients of the following preparations now being sold to the profession through the drug stores: (1) Papine, made by Battle & Co.; (2) Celerina, and (3) Aletris Cordial, the two latter made by the Rio Chemical Company. On what does their virtue (if they have any) depend?

E. R. MILLER, M.D., Frederick, Md.

ANSWER.—1. Papine is a simple aqueous-alcoholic solution of morphin (1 grain to each ounce). It is exploited under the utterly unwarranted claim that it "does not nauseate, constipate nor create a habit." (See THE JOURNAL, April 29, 1911, p. 1278.)

2. Celerina is a shotgun mixture, said to contain, in addition to 42 per cent. alcohol (about the same percentage as that found in whisky), kola, viburnum, celery, cypripedium, xanthoxylum and aromatics.

3. Aletris Cordial is declared to contain 28 per cent. alcohol (a much higher percentage than is found in the strongest wine), besides three obsolete and valueless drugs, aletris, helonias and scrophularia. Whatever virtue there may be in either Celerina or Aletris Cordial is that derived from alcohol.

STANDING OF A NON-RESIDENT PHYSICIAN

To the Editor:—During the past summer I spent my vacation in a small town in Michigan and I was frequently consulted by the resorters, both in emergencies and at other times, the nearest resident physician being located in a town about eight miles distant. I wish you would kindly answer the following questions for me, remembering that I am licensed to practice in the state of Ohio, only:

1. Have I the legal right to treat these people gratis?

2. Have I the legal right to charge for my services and would I have any standing in court in event payment of my bill was refused and I should decide to sue for the same, irrespective of where the patient lives?

A. B., Cincinnati.

We submitted the foregoing questions to Dr. Beverly D. Harison, Secretary of the Michigan State Board of Registration, who sent the following answers:

ANSWER.—1. The Michigan law requires that all practitioners should possess a certificate of registration, or license, issued by this board, and that such certificate should be filed with the clerk of the county in which the physician practices. The Michigan medical act exempts persons giving emergency treatments, but of course there is a limitation to the attendance, when persons giving such treatment could not charge for same. The Michigan act does not require that a person, in order to be convicted, should charge a fee. Therefore, a non-registered physician giving his services to people would be in violation of the act.

2. Absolutely no standing whatsoever in any court.

ORTHOSTATIC ALBUMINURIA

To the Editor:—Can you refer me to literature embodying recent investigations concerning orthostatic albuminuria?

LUELLA E. AXTELL, M.D., Marinette, Wis.

ANSWER.—The following is a partial list of references to works on this subject:

Reyber, P.: Relation between Orthostatic Albuminuria and Tuberculosis, *Monatschr. f. Kinderh.*, July, 1913. Abstracted in THE JOURNAL, July 19, 1913, p. 230.

Fitzsimmons, H. J.: Orthostatic Albuminuria Treated by Exercise, *Boston Med. and Surg. Jour.*, Nov. 13, 1913.

Dietl, K.: Pathology of Lordotic Albuminuria, *Wien. klin. Wchnschr.*, Feb. 13, 1913. Abstracted in THE JOURNAL, March 22, 1913, p. 951.

Gomolitsky, V.: Orthostatic Albuminuria, *Ztschr. f. klin. Med.*, 1913, lxxvii, Nos. 1-2. Abstracted in THE JOURNAL, April 5, 1913, p. 1117.

Arnold, W.: Orthostatic Albuminuria and Tuberculosis, *München. med. Wchnschr.*, March 4, 1913. Abstracted in THE JOURNAL, April 12, 1913, p. 1196.

Jehle, L.: Correction of Spinal Anomalies in Orthostatic Albuminuria, *Wien. klin. Wchnschr.*, Feb. 27, 1913.

Sturm, J.: Orthostatic Albuminuria, *München. med. Wchnschr.*, April 8, 1913.

Wendenburg, F.: Etiology of Orthostatic Albuminuria with Special Regard to Tuberculosis, *Arch. f. Kinderh.*, 1914, lxii, Nos. 1-2.

Bass, M. H., and Wessler, H.: Blood-Pressure in Children Showing Orthostatic Albuminuria, *Arch. Int. Med.*, April, 1913. January, 1914. Abstracted in THE JOURNAL, Feb. 7, 1913, p. 487, and THE JOURNAL, June 7, 1913, p. 1832.

LYMPH-NODES AND LYMPH-GLANDS

To the Editor:—Will you please define for me your understanding of the words "nodes" and "glands"? Is there a proper field for the term "lymphatic gland" and what is the field of application for the term "lymphatic node"?

H. E. PEARSE, M.D., Kansas City, Mo.

ANSWER.—This question was answered in THE JOURNAL, May 17, 1913, p. 1560.

LITTEN'S SIGN

To the Editor:—Please explain Litten's sign, as mentioned in THE JOURNAL Sept. 12, 1914, p. 943.

B. J. LEAHY, Port Jervis, N. Y.

ANSWER.—Litten suggested in 1892 a procedure for noting the movements of the diaphragm. The patient should lie on his back with his face away from the light which should fall from the head or foot of the bed. The observer stands three or four feet away with his back to the light and observes the chest at an angle of about 45 degrees. In inspiration, a short, narrow shadow or wave starts on either side at about the

sixth interspace and passes downward over two or more ribs or even to the margin of the ribs. In expiration it begins below and moves upward, but is less easily seen. In normal persons it moves, usually, more than 6 cm. It is best seen in spare, muscular persons whose chest walls are not too thick. It is absent when the pleural cavity contains fluid or air, and when it is obliterated by adhesions, in pneumonia of the lower lobe in emphysema of the lungs, and in intrathoracic tumors low down in the chest. With lessening of the extent of the movement, the respiratory capacity is diminished and tuberculosis may be looked for.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Little Rock, November 10-11. Sec., Dr. W. S. Stewart, 404 Citizens Bank Bldg., Pine Bluff. Homeopathic, Little Rock, November 12. Sec., Dr. Scott C. Runnels, 900 Scott St., Little Rock. Eclectic, Little Rock, November 10-11. Sec., Dr. C. E. Laws, Ft. Smith.

CONNECTICUT: New Haven, November 10-11. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven. Homeopathic, New Haven, November 10. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven. Eclectic, New Haven, November 10. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

LOUISIANA: New Orleans, October 29-31. Sec., Dr. E. L. Leckert, New Orleans.

MAINE: Portland, November 10-11. Sec. Dr. Frank W. Searle, 776 Congress St., Portland.

MISSISSIPPI: Jackson, October 27-28. Sec., Dr. E. H. Galloway, Jackson.

NEBRASKA: Lincoln, November 11-12. Sec., Dr. H. B. Cummins, Seward.

NEVADA: Carson City, November 2. Sec., Dr. S. L. Lee, Carson City.

NEW JERSEY: Trenton, October 20-21. Sec., Dr. H. G. Norton, Trenton.

SOUTH CAROLINA: Columbia, November 9. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Waco, November 10-12. Sec., Dr. W. L. Crosthwait, Amicable Bldg., Waco.

Higher Preliminary Requirements in Oklahoma

A letter from Dr. John W. Duke, secretary of the Oklahoma State Board of Medical Examiners, says that, in accordance with the requirements of the medical practice act, one year of collegiate work, in addition to an accredited four-year high-school education, will be required of all applicants who graduate in 1918 and thereafter. This applies to all students matriculating in the session of 1914-1915 and thereafter who may desire to practice medicine in Oklahoma.

There are now twenty-two states in which the requirement of one or two years of collegiate work has been made obligatory for those who intend to practice in those states. These states, the number of collegiate years required and the time the requirement is effective are as follows:

State Examining Board of:*	Number of Years Required	Affects Students Matriculating	Affects Applicants Graduating
Minnesota	2	1908-09	1912
North Dakota	2	1908-09	1912
Colorado	2	1910-11	1914
Connecticut	1	1910-11	1914
Kansas	1	1910-11	1914
Indiana	2	1910-11	1914
Utah	1	1910-11	1914
Iowa	2	1911-12	1915
South Dakota	2	1911-12	1915
Vermont	1	1912-13	1916
Kentucky	1	1914-15	1918
Michigan	1	1914-15	1918
New Hampshire	1	1914-15	1918
Oklahoma	1	1914-15	1918
Pennsylvania	1	1914-15	1918
Rhode Island	1	1914-15	1918
Virginia	1	1914-15	1918
Washington	1	1914-15	1918
Alabama	2	1915-16	1919
Arkansas	1	1915-16	1919
California	1	1915-16	1919
Illinois*	1	1915-16	1919

* Illinois requires a five-year course, including a preliminary year in physics, chemistry and biology, of all applicants for license to practice medicine in that state who graduate after July 1, 1918.

Book Notices

SEROLOGY OF NERVOUS AND MENTAL DISEASES. By D. M. Kaplan, M.D., Director of Clinical and Research Laboratories of the Neurological Institute, New York City. Cloth. Price, $3.50 net. Pp. 346, with illustrations. Philadelphia: W. B. Saunders Company, 1914.

The author, having already published several articles on serology, has now combined in one volume everything of value contained in these articles. The book is divided into four parts. Part 1 deals with technology. In the space of eighty-three pages he describes and pictures the technic of lumbar puncture as well as methods of examination and interpretation of findings, not omitting the gold-sol reaction of Lange. In this chapter, though brief, nothing of importance has been sacrificed. At its conclusion the author indulges in some reflections on the attitude of the serologist which laboratory workers may well consider. He believes that "every serologist learns, sooner or later, that no matter how conscientious his working methods are, a number of errors cannot be avoided with the Wassermann reaction, and that some of the positive reports submitted were unquestionably of negative material." The author advises, therefore, to regard the entire test as only of secondary importance in making a complete study of a case of syphilis. In his opinion the serologist's attitude is a greater factor in the value of a Wassermann reaction than is the standardization of the reagents. "The question of reliability resolves itself into this: A worker reports either too many positive Wassermann reactions in non-syphilitic persons, or too many negative reactions in those who were infected. Unless, therefore, the serologist determines on which side he intends to err, his results will, accordingly, be uncertain." He urges, therefore, never to diagnose syphilis in the laboratory, as the laboratory worker should not consider himself competent to give a final decision. He believes that only those serums should be reported as positive which have withstood every attempt at negativation. Further, to obtain an unbiased opinion from the laboratory, it is necessary to withhold the clinical findings in the case. He deprecates the attempts which have been made to increase the sensitiveness of the test by using methods that are calculated not to make the number of negative findings greater, but, on the contrary, to make the number of positives as great as possible. These methods, he thinks, are the result of laboratory overzealousness combined with insufficient clinical knowledge. From this point of view he criticizes Noguchi's modifications of the Wassermann reaction and also Hauptmann's *Auswertungs-Methode*, the last of which consists in the use of quantities so large that a positive result is eventually obtained in some non-specific spinal fluids. In concluding this section of the book the author admonishes clinicians to acquaint themselves with the views of the serologist before placing any confidence in his results. He warns clinicians against the "unerring" serologist, whom he considers a menace to physician and patient. In Part 2 the author discusses without bias the serology of nervous and mental diseases of non-luetic etiology. This constitutes a fairly complete summary of work done by himself and others.

Of greatest value to the neurologist is Part 3. Here the author displays a practical acquaintance with the diagnostic difficulties of nervous and mental diseases scarcely to be expected from a serologist. While it is impossible in this review to enter into details, we are compelled to state that the views expressed therein are on the whole sound and will meet the approval of neurologists. Part 4 is devoted to the therapeutic uses of salvarsan, its administration, dosage, technic, after-treatment, etc. This section comprises sixty-three pages and is complete in itself. No less praiseworthy is the addition at the end of the volume of seventy pages of bibliography, culled from the most important literature of the world. If it is permissible to use a common figure of speech, we may predict that Kaplan's book will find a public ready to receive it with open arms.

THE ART OF COMPOUNDING. A Text-Book for Students and a Reference Book for Pharmacists at the Prescription Counter. By William L. Scoville, Ph.G., formerly Professor of Theory and Practice of Pharmacy in the Massachusetts College of Pharmacy. Fourth Edition. Cloth. Price, $3 net. Pp., 390, with 76 illustrations. Philadelphia: P. Blakiston's Son & Co., 1914.

This book is intended as a text for students in pharmacy and as a reference work for pharmacists at the prescription counter. Chapters are devoted to the prescription, nomenclature, mixtures, incompatibilities, sterilization and disinfection, biologic products, and the various forms in which pharmaceuticals are dispensed—such as emulsions, pills, tablets, ointments, suppositories, etc. The directions for pharmaceutical manufacturing processes are brief but for the most part clear. While intended primarily for students in pharmacy, the book should prove useful to a physician who dispenses if he has not taken a course in pharmacy. Little pitfalls which the dispenser is constantly liable to meet are pointed out and methods for overcoming them when encountered are discussed. In some respects the work is not up to date. For example, in the discussion of enteric coatings no reference is made to the formaldehyd-gelatin combination which has come into use of late years.

A HANDBOOK OF PSYCHOLOGY AND MENTAL DISEASE. For Use in Training Schools for Attendants and Nurses and in Medical Classes and as a Reference for the Practitioner. By C. B. Burr, M.D., Medical Director of Oak Grove Hospital (Flint, Mich.) for Mental and Nervous Diseases. Fourth Edition. Cloth. Price, $1.50 net. Pp. 235, with illustrations. Philadelphia: F. A. Davis Company, 1914.

This manual is offered by its author for use in training schools for attendants and nurses. The expert psychologist who studies it will probably be able to analyze what the author intends to convey. The average attendant or nurse will be far beyond his depth after leaving page one. A new chapter has been added entitled "Symbolism in Sanity and in Insanity." It is practically a catalog after the Freudian concept of common objects and their sexual equivalents. The nurses will possibly find this entertaining. The reporting of numerous cases from the author's experience is interesting, and treatment is given in simple, easily understood language. It seems doubtful, however, whether a book of this character can have much of a field of usefulness.

THE ASPLEY COOKERY BOOK. Containing 503 Recipes for the Uric-Acid-Free Diet. By Mrs. John J. Webster and Mrs. H. Llewelyn. New Edition. Cloth. Price, $1.40 net. Pp., 268. Philadelphia: P. Blakiston's Son & Co., 1914.

This is a guide for those who wish to avoid the use of meat and other substances containing uric acid or its precursors and yet secure palatable dishes somewhat resembling those cooked with heat. Little space is occupied with argument to sustain the peculiar practices of the followers of Haig, but the practical recipes are at once set before the reader. Much use is made of vegetables and nuts, and the directions are very explicit and seem calculated to secure good results. Some of the terms used will not be readily understood by American readers, being provincial English. Reference may be made to "coker" butter, which, however, appears to be a proprietary article although "coker" is used in England as equivalent to coco.

MENTAL DEFICIENCY (AMENTIA). By A. F. Tredgold, L.R.C.P., M.R.C.S., Consulting Physician to the National Association for the Feeble-Minded. Second Edition. Cloth. Price, $4.25 net. Pp. 491, with illustrations. New York: William Wood & Co., 1914.

The revised edition of Tredgold's valuable book contains a new chapter dealing with mental tests and case-taking which is interesting and scientific. Many chapters have been entirely rewritten, bringing the work up to date. The subject of mental deficiency in its various phases, including the sociologic and medicolegal aspects, has been handled with great skill and conservatism. An admirable feature of the book is the willingness to give credit to those who deserve it, regardless of nationality. In common with most English authors, Tredgold makes use of simple phraseology, intelligible alike to specialist and general practitioner. We commend this work as one of the best short text-books on the subject in any language.

Miscellany

Health of Flax and Linen Workers

The government has issued the report of the Departmental Committee on humidity and ventilation in flax mills and linen factories. Reference is made to Dr. Legge's report based on 1,500 observations on the body temperature of the operatives in wet spinning rooms and humid weaving sheds during the summer of 1912. The figures so obtained, he thinks, "suggest that, continued for hours, day after day, and year after year, the effect would be likely in the long run somewhat to affect health. In other words, persons in an atmosphere where the wet-bulb exceeds 75 F. are working under adverse physiologic conditions." The investigations of the committee have shown that the conditions in wet spinning rooms might, without detriment to the process of manufacture, be improved in such a manner as to give additional comfort and better conditions to the persons employed. The existing regulations have done much in this respect, and in some mills had been carried out in a most exemplary manner; in others, however, there is ample room for improvement. It is at present required that in wet spinning rooms the difference between the dry and wet-bulb temperatures shall be not less than 2 degrees, and it might be thought therefore that this small difference is necessary for manufacturing purposes. The work might be carried on with a much wider temperature difference. It is impracticable in every instance to require that the temperature of the rooms should not exceed a given point. The committee is therefore of the opinion that whereas at all times ventilation conforming to the present standard of five volumes of carbon dioxid per 10,000 in excess of that in the outside air should be provided. Special requirements are called for when the wet-bulb temperature reaches 75 F., the point at which bodily discomfort begins. When this point is reached they recommended that means shall be taken to introduce 1,000 cubic feet of air per hour for every linear foot of trough installed in the room, the ventilation to be arranged so as to insure that the distribution is uniform throughout the room. With regard to linen weaving factories the committee states that for the manufacture of fine linens a difference of about 2 degrees between the dry and wet-bulb temperatures must be maintained, even at high temperatures. This in one sense is much to be regretted, for the records taken by the committee show that in summer the wet-bulb temperature frequently exceeds the limit at which bodily discomfort begins and above which long-continued work can hardly fail to be injurious. The results of their inquires and experiments have compelled them to recognize that unless an important industry is interfered with in such a way as to risk loss of trade and its transference to other countries in which no special regulations for flax are in force, with its incidental hardships falling largely on the operative classes, work in a limited number of factories must continue under conditions causing bodily discomfort and possibly injury in the long run. On the other hand, the medical evidence points to the fixing of a definite limit of wet-bulb temperature at which artificial humidification should cease. The committee accordingly recommends that all artificial humidity (except such as was caused by the evaporation of cold water) should cease when the wet-bulb temperature reaches 80 F.

Safety and Sanitation Maxims and Observations

E. R. Hayhurst, in the *Monthly Bulletin of the Ohio State Board of Health*, presents the following drawn from speeches made at the recent Safety and Sanitation Conference held in New York City:

German unions penalize their own members for failing to observe health regulations within workshops.

Varnish works of Germany have been rendered practically free of odors by exhaust ventilation systems.

Children under 14 years of age cannot be taught ideas of foresight-to-be-remembered; therefore they are intellectually

irresponsible. Many of our ignorant foreign workmen are beneath the 14-year-old child in power of foresight.

Bad ventilation, heat, fatigue and night work lead to drowsiness, to accidents and to disasters to health.

Fourteen nations of Europe do not allow night work of any kind for women, and limit the kind and hours of day work.

Sanitary measures lead to efficiency, economy and contentment, as well as greater production and more wages.

The representatives of two of the largest lead and paint corporations in America stated that they had been able to make some of their plants so mechanically perfect as to be fool-proof against dangers of lead poisoning.

First aid in the Carnegie Steel Company's plants has reduced infections from 50 per cent. to 0.1 per cent.

It is five times as much to the interest of the employer as to that of the employee to promote welfare work.

There are 400,000 maimed and debilitated workers in the United States. In New York a special trade school and employment bureau has been started on account of this. In Boston, one company, employing 1,000 men, does not discharge its defectives, but fits the job to the man. They have noticed that heart diseases have not only been checked, but markedly improved within a few months' time. Through a well-regulated "first-aid" system this company has had no infections for two and one-half years.

The Carnegie Steel Co., by first-aid measures, has handled 8,000 cases of foreign particles in the eyes, with no infections.

The representative of a company employing 20,000 men said: "We use the physician to get to all of our people. We have found out that workmen will listen to advice and counsel from physicians even on industrial questions without the ever-present suspicion of some ulterior motive."

Mr. George B. Cortelyou, president of the Consolidated Gas Co., New York, stated that to the employee is due proper remuneration, good sanitation, relief when sick or injured, insurance for old age, and a guarantee of protection to his family after death. There must be no charity about this. The self-respect of both capital and labor must be maintained. This is necessary for future competition in business.

A Big Field for a Big Man

Sooner or later Congress will find it necessary to pass on the proposal that a United States Department of Public Health be established. The best medical opinion of America demands it. The American Medical Association has memorialized Congress in its favor. 'Calling the American Medical Association "the Medical Trust" will not serve the opponents of the proposed department. The fact remains that this Association is the great and influential medical body of the country and that its proposals carry enormous weight.

It is claimed that half a million Americans die yearly of preventable disease. The figure is doubtless under rather than over the mark. Health departments do lower the death-rate of city, state and nation. The work of the United States Public Health Service in California and New Orleans during recent outbreaks of the bubonic plague evidences its efficiency. The chief opponents of the proposed bureau seem to be medical men of the various smaller schools of practice.

The *Southern Medical Journal*, in its September issue, makes a proposal that will appeal very powerfully to the average American, indifferent to professional jealousies and unconcerned in the warfare of the schools. This Southern journal proposes that a public health department be created and Surgeon-General Gorgas, the man who fought the health battles of the Panama Canal and cleaned up "the Zone," be placed at its head.

The world knows the work of Surgeon-General Gorgas. Congress is about to give him the highest honors within its power. The American people rank him with Colonel Goethals. Should such a department, in the wisdom of Congress, be created, and its headship awarded by popular election, we prophesy that Colonel Gorgas would sweep the country from Calaveras County, California, to the Island of Nantucket, which is "east of daown East."—St. Louis *Republic*.

Medicolegal

Physician Made Agent to Contract with Hospital for Care of Injured Employee

(*Omaha General Hospital vs. Streklow* (Neb.), *147 N. W. R. 846*)

The Supreme Court of Nebraska reverses a judgment which was rendered in favor of the defendant in this action which was brought to recover for the care and treatment for twenty-nine weeks of an employee who had been seriously injured. The court holds that when an employer, at the time his employee receives a serious bodily injury, calls his own regular physician and surgeon over the telephone and instructs him "to come and take care of the injured man," and at the time of giving such direction well knows that the injuries of his employee are of such a serious character as to render it necessary immediately to remove him to a hospital, and the physician at once responds and takes the man to a hospital, and for the purpose of inducing the hospital authorities to receive him states to them that the principal for whom he is acting will be responsible for the payment of the bill of the injured man, the employer is bound by such acts and declarations on the part of his agent, the physician.

Nor will the employer have any right to terminate his liability by subsequently giving notice that he will not be responsible for care and treatment "from now on," when the patient is yet incapable of being removed or discharged from the hospital without grave danger to his life or health. Under the circumstances it is an implied condition of the contract that the employer can terminate his liability to the hospital only by removing the patient, or when he can be dismissed by the hospital without serious danger to his life or health, or by showing that the injured man has means out of which the hospital can or should collect its pay.

Here the defendant did not direct the physician simply to administer first aid or to give emergency treatment, but he told him "to come and take care of the injured man." He did the proper and humane thing, just what any employer ought to do when an employee is lying helpless as the result of an injury received in his employment. He knew, as well as he knew anything, that the physician would at once take the injured man to a hospital, and, if he wanted to place any limitation on the physician's authority to bind him for services rendered by the hospital, then was the time for him to impose such limitation. In other words, when the physician took the injured man to the hospital and stated that the defendant would be responsible for his treatment, it was the same as if the defendant had himself taken him there and made that statement, and he had no more right to disaffirm what was done and said by the physician than if he had done and said the same things himself. After having unloaded his helpless employee on the hospital, he could not relieve himself from further liability by his own declaration, but it was rather his duty to pay the hospital charges up to that time and remove the man to some other place. Nor was it a case to expect the hospital to dispose of by giving notice to the poor authorities.

Admissibility in Evidence of Hospital Records

(*Ribas vs. Revere Rubber Co.* (*R. I.*), *91 Atl. R. 58*)

The Supreme Court of Rhode Island holds that a hospital record is admissible in evidence in a personal injury case to show misconduct of the plaintiff at the hospital, preventing to some extent a satisfactory recovery from his injuries. More particularly, the court holds that in this case, where the plaintiff suffered a fracture of the left leg between the hip and the knee, the hospital record should have been admitted in evidence to show his unruly behavior and disobedience of the positive orders of the surgeons and nurses as to keeping quiet and refraining from movements which would be likely seriously to interfere with the proper adjustment and knitting together of the fractured bone.

The court says that it is not necessary that there should be any express statute or regulation creating the authority

or duty to make such a record. If the duty of making it devolved, under the rules and regulations of the hospital, on the person, say an intern, who made it, that is sufficient in that regard, and the source from which that duty originated is not material. Such duties may arise from the casual direction of a superior, or from functions necessarily inherent to the position which the recorder occupies.

In making a record of this character which shall be admissible in evidence it is necessary that the entries therein be made contemporaneously with the facts to which such entries relate. That, however, does not mean that a record must be made at the moment of the occurrence, but within such time thereafter as would reasonably make it a part of the transaction. The record in question in this case was kept by an intern or assistant surgeon at the hospital. It appeared to have been his business, as the recording official, to place on the record such facts relating to the patient as were communicated to him by his associates and subordinates, as well as those which came under his personal observation. It also appeared that the record in question was written up by him every third day. The court thinks that, taking into consideration the regular method in which these records were made and the apparent impracticability, in a hospital, of recording each event as it occurred, the facts relating to the plaintiff were recorded within such reasonable time as would make them a part of the transaction, and therefore contemporaneous within the meaning of that term. The record was not rendered inadmissible because some of the facts recorded were not within the personal knowledge of the recorder; neither because the facts reported to him and by him recorded were capable of proof by those making such reports, nor because the witnesses who made reports to the recorder had testified at the trial of the case. They were two distinct sources of testimony, each having a value independent of the other, and the defendant was entitled to the corroborative effect of the record on the testimony of the witnesses.

Second Physical Examination Should Be Allowed to Defendant Misled in First

(Rief vs. Great Northern Railway Co. (Minn.), 148 N. W. R. 309)

The Supreme Court of Minnesota holds that it is error in a personal injury case not to permit a second physical examination of the plaintiff, the defendant having been misled by the plaintiff in the first examination as to the injury claimed. The court says that compelling a plaintiff in a personal injury case to submit to a physical examination is largely within the sound discretion of the trial court. And where one examination has been had a refusal to grant a second will not ordinarily be sufficient grounds for a new trial. But the circumstances in this case were unusual. When the plaintiff was being examined physically by the defendant's physicians, one of them, in manipulating the injured arm, asked the plaintiff whether he had any pains elsewhere, and he answered in the negative. Consequently no effort was made to examine with a view to ascertaining any defect in the spine or sacro-iliac joint, where the two medical experts of the plaintiff subsequently by their testimony located what they concluded to be the serious injury. Of course one familiar with personal injury actions knows that a defendant must be prepared to meet injuries and shocks to the nerves and nervous system; for they are almost always alleged and attempted to be proven. But these and other allegations involving the whole body must be considered reasonably when applied to the facts of each case. It was perfectly plain in this case that when the plaintiff was examined neither the defendant nor any of its medical experts, one of whom was the surgeon who set the arm and had the plaintiff under observation and treatment for a month, suspected that he suffered or would claim any evil results from his fall, except such as might be traced to the fractured arm. Moreover, during his examination the plaintiff himself, as above noted, led them to believe that none other was claimed. Wherefore the court holds that it was error not to permit a second physical examination of the plaintiff, and, because it was not done, grants the defendant a new trial, after a judgment had been rendered in favor of the plaintiff.

Society Proceedings

COMING MEETINGS

Amer. Academy of Ophthal. and Oto-Laryn., Boston, Oct. 19-21.
Amer. Assn. for Study and Prevention of Inf. Mortal., Boston, Nov. 12.
Amer. Public Health Association, Jacksonville, Fla., Nov. 30-Dec. 5.
Medical Society of Hawaii, Honolulu, Nov. 28-30.
Mississippi Valley Med. Assn., Cincinnati, Oct. 27-29.
Southern Medical Association, Richmond, Nov. 9-11.
Virginia Medical Society, Washington, D. C., Oct. 27-30.

NEW YORK ACADEMY OF MEDICINE

(Meeting held Oct. 1, 1914)

The President, DR. WILLIAM M. POLK, in the Chair

Wesley M. Carpenter Lecture: The Physiologic Equivalent of War

DR. WALTER B. CANNON, Boston: My original intention was to present an account of some of the recent investigations which we have conducted in the Harvard Physiological Laboratory, but the events of the past summer have presented a practical application of their results pertinent to present interest.

The doctrine of human development from subhuman antecedents has done much to unravel the complex nature of man in solving the puzzle of the details and conditions of anatomic structure and in accounting for functional peculiarities, but in no respect has biology contributed more to clarify our views than in throwing light on the ways of human behavior. The comparative study of the behavior of men and lower animals is making it clear that the springs of action are to be found in the influence of certain emotions which express themselves in characteristic instinctive acts. The combinations, anger-emotion with pugnacity-instinct, and fear-emotion with flight-instinct, are common to lower animals and to man. The major emotions, fear and anger, are peculiar in being accompanied by bodily changes which are probably more profound than those attending any other affective states. The parts of the organism peculiarly called into action in emotional excitement are glands and the smooth muscle of viscera. The pouring out of tears, the "cold sweat," the dilation of pupils, the erection of hairs, the pallor from contracted blood-vessels are well-known changes from the routine of life in organs not subject to voluntary control, but there are other important visceral responses in strong emotions. Observations with the Roentgen ray brought to my attention the fact that in animals any sign of rage, anxiety or distress would be accompanied by total cessation of the movements of the stomach and intestines. It has since been shown that the secretion of every one of the digestive glands, as well as the flow of bile, is stopped under great excitement.

These emotional alterations are directly wrought by the so-called sympathetic division of the visceral system. The adrenals are subject to the same impulses. When these glands are stimulated through their nerve supply they pour into the blood stream epinephrin, which has peculiar properties in relation to the organs to which sympathetic fibers are distributed. It is capable of evoking in these organs all the changes that are evoked by the sympathetic nerve impulses themselves. Experiments with the blood of "quiet" and "excited" animals demonstrated that the inhibitory influence of excited blood is in fact due to adrenal secretion and that, therefore, the adrenal glands were brought into action under strong emotions. This conclusion has been confirmed both in this country and in England. For many years it has been recognized that the injection of epinephrin brings about a liberation of sugar from the liver and thereby may increase the sugar content of the blood to such an extent as to produce glycosuria. It alters the distribution of blood in the body, depleting abdominal viscera, and flushing the heart, the lungs, the central nervous system and the limbs. It seems also to be an antidote for muscular fatigue. After these investigations the question arises, "Does the adrenal secretion poured out in emotional excitement likewise produce or cooperate in producing these same effects?" We have found

that from emotional excitement alone a greater or less degree of glycosuria results. The glycosuria fails to appear if the adrenals are removed. The establishment of glycosuria, therefore, implies help from the adrenal secretion. Epinephrin, besides checking the function of the digestive organs, drives out the excess of blood no longer needed there and forces it more rapidly through the heart, lungs, central nervous system and the limbs. It is significant that all these organs are intimately cooperative in vigorous muscular exertion. Small doses of epinephrin serve to restore fatigued muscles. These remarkable changes are involuntary, and hence it is pertinent to inquire as to their utility in either preserving the welfare of the organism or guarding it from injury. Underlying both fear-flight and anger-attack emotions is the instinct of self-preservation. Under circumstances demanding either flight or combat there is use of the great muscular masses in supreme and perhaps prolonged effort. The stored up sugar together with the adrenal secretion poured out under great excitement would place the muscles of the body unqualifiedly at the disposal of the nervous system. At the same time the difficulty which nerve impulses might have in calling the muscles into action are practically abolished. In harmony with this interpretation are the vascular changes wrought by the epinephrin in cooperation with sympathetic discharges which give to the parts called on for action a bounteous supply of blood. Forced respiration and "sweating" are also adaptive reactions directly serviceable in making the organism more effective in the struggle which fear or rage may involve.

The major emotions fear and anger exert an energizing influence which may lead to the accomplishment of extraordinary feats. Periods of intense excitement frequently yield a sense of overwhelming strength. These moments give intense satisfaction, and there is a fascination found in the critical dangers of adventure. For these reasons vigorous men go forth to seek danger and to run large chances of injury. In the major sports the conditions are favorable for the development of intense emotional excitement and for the exhibition of great feats of strength and endurance. Football with all the preparation and circumstances attendant on a great contest and the additional excitement furnished by the large crowds of spectators makes every member of a team realize his individual responsibility for the supreme, all important result—victory for his group. Last fall twenty-five members of the Harvard University football squad were examined directly after the game with Yale, and glycosuria was found in twelve of the men. Five of the twelve were substitutes who did not have a chance to play, and it was clear in the case of these athletes that the bodily responses were wholly analogous to those previously found as accompaniments of strong emotions in the lower animals. Furthermore, the changes in the men were quite as directly adapted to the powerful muscular efforts which their game demanded as were the similar changes which occurred in the lower animals and which were adapted to their occasional fierce struggles for existence. What is true of football is true to a lesser degree of such sports as rowing, running and hurdling. The analogy between fear and rage as exhibited in animals in their struggle for existence is analogous to those emotions in human beings which sometimes seize on individuals in groups and spread like wildfire into larger and larger aggregations of men, until vast populations are shouting and clamoring for war. The strength of the fighting instinct in man has been one of the main arguments of the militarists. They argue that the warlike qualities are essential to human welfare, and they must be occasionally exercised lest the people sink into self indulgence and become weakened and softened. War disciplines character, teaches men to be brave and patient, promotes virility and hardihood and renews the true order of life's values. These arguments are to-day strongly contested. War has become too horrible, it is conducted on too stupendous a scale of carnage and expenditure, it interferes too greatly with consecrated efforts to benefit all mankind by discovery and invention; it involves too much suffering among persons not directly concerned in the conflict; it is too vastly at variance with the methods of fair dealing that have been established between man and man; the human family has become too strongly knit to allow some of its members to bring on themselves and all the rest poverty, distress and a long heritage of bitter hatred and resolution to seek revenge. There is then a war against war.

The situation reveals clearly the necessity of preserving the martial virtues. What is needed is not a suppression of these capacities to feel and act, but their diversion into other channels where they may have satisfactory expression. Henry James suggested as a moral substitute for war, service for the state in hard and difficult occupations, and believed that the thing needful was to inflame the civic temper as past history has inflamed the military temper. As an alternative to these assertions, since it has been shown that as a result of excitement the body goes on a war footing, a number of fundamental physiologic changes occurring, all of them adapted to the putting forth of supreme muscular and nervous power which was what primitive battle consisted of through countless generations, I would suggest international athletic contests, such as the Olympic games, which would do for our young men much that is now maintained as peculiar to the values of military discipline. They have further to commend them the high standards of honor and fairness in sport, its unfailing revelation of excellence without distinction of class, wealth, race or color; the ease with which it becomes an expression of patriotism; the respect which victory and pluckily borne defeat inspire in competitors and spectators alike; the extension of acquaintance which follows from friendly and magnanimous rivalry among strong men.

The evidence is perfectly clear-cut that pugnacious tendencies of men are invited by primitive emotions and are supported by fundamental physiologic changes that through eons of racial inheritance have given the body vigor for combat. No dull routine of drill, or any other deadening procedure, will call these energizing mechanisms into action. On the other hand, the hazards of hard-fought athletic contests stir the elemental excitements and mobilize the bodily forces just as the hazards of ancient war used to do. War and the preparedness for war nowadays have become too machine-like to serve as the best means of preserving and disciplining these forces. Bending the trigger finger is too trifling a business. The exhilarating swing and tug and quick thrust of the big limb muscles have vanished. There must be no emotion because it spoils the aim. If, then, the fighting abilities are to be continued, how much better to exercise them in natural rather than in artificial actions, how much more reasonable that men should struggle in the ancient ways, one against another, body and spirit, for victory in the supreme tests provided by the great games.

KENTUCKY STATE MEDICAL ASSOCIATION

Sixty-Fourth Annual Meeting, held at Newport, Sept. 23-25, 1914

The President, Dr. JOHN J. MOREN, Louisville, in the Chair

Renal Tuberculosis, Its Diagnostic Difficulties and Surgical Problems

DR. FILIPP KREISSL, Chicago: In a small number of cases in which we have recovered bacilli-carrying urine before nephrectomy, the bacilli disappeared permanently after the operation. Extensive vesical ulcerations oftentimes point to bilateral kidney involvements, but should not contra-indicate nephrectomy. We have seen extensive lesions heal spontaneously after the operation, and at other times a few small ulcerations required prolonged postoperative attention. By conservative surgery, unilateral or bilateral nephrotomy, and later ureterostomy, we can do a great deal to alleviate the torturing cystitis, reduce the septic fever, and prolong and make life bearable.

DISCUSSION

DR. CARL L. WHEELER, Lexington: In the last eight or ten years I have encountered sixteen cases of renal tuberculosis. Four were bilateral, twelve were unilateral. Of these there were nine females and two males. In ten cases the tuberculosis was on the right side, and in two on the left. Of

the bilateral cases three patients were operated, and of the near deaths three went down with lung involvement within six months. The other patients have had a stormy existence with hematuria, irritable and contracted bladder.

DR. J. GARLAND SHERRILL, Louisville: In 2 per cent. of the cases only do we find solitary involvement of the kidney. The age of the patients is usually from 20 to 30 years. This is an important point in diagnosis. The earliest symptoms are frequency of micturition and an increased amount of urine. The first symptom that calls the patient's attention to the condition is hematuria. The second, perhaps, is the painful urination or dysuria. Vesical tenesmus develops frequently after the tubercle bacillus passes down and with it pus products from the inflamed kidney. This occurs after there has been a breaking down of the kidney tissue in the calices and emptying into the pelvis of the kidney.

DR. IRVIN ABELL, Louisville: From experience gained in removing stones from the lower end of the ureter in tuberculous patients, as a rule I think it should be conserved. The operation which will give permanent relief is the one which should be done. A ureter that is left behind may not give permanent trouble and eventually clears up without requiring a secondary procedure.

DR. J. W. KINCAID, Catlettsburg: Three diagnostic points should excite suspicion as to a tuberculous condition being present. One is the presence of indigestion. The next is progressive loss of weight, however slight, coupled with a rise of temperature in the evening, with subnormal temperature in the morning. These will nearly always—at least in very many cases—point out a beginning tuberculous process somewhere.

DR. CURRAN POPE, Louisville: A word of caution is necessary regarding the danger of the general practitioner dismissing patients so frequently with a diagnosis of neurasthenia. Neurasthenia vera is, comparatively speaking, a rare disorder. Frequently such cases are really cases of latent tuberculosis.

Alcohol and the Public Health

DR. J. N. HURTY, Indianapolis, Ind.: Where squalor, immorality, bestiality and poverty exist, there alcohol and other drugs have sway. Insanity and crime trail after alcohol, and in its wake come ill health and disease. A high authority says 25 per cent. of insanity is due to syphilis; 10 per cent. is due to accident; 40 per cent. is hereditary, and 25 per cent. is due to alcohol. Farmers are great buyers of patent medicines. They generally have dyspepsia first. The dyspepsia comes from bad food, bad cooking and rotten teeth preventing proper mastication. When dyspepsia accepts the cordial invitation extended to it, and arrives with both feet, the victim rushes to patent medicines and finds fatuous relief in the alcohol they contain. Then diseases appear; for on top of the dyspepsia climbs alcoholism, and on it ride many kinds of disease. Alcohol is opposed to the public health, for it hurts any animal organism into which it is taken. It is not a food; it does not aid digestion; it does not further the good of the body; on the contrary it hurts. Its use as a beverage not only opposes personal health, but also the public physical and moral health, and also the public economic health. Alcohol is dope. For every dollar of revenue derived from alcoholic beverages $2 of public cost for crime, insanity and delinquency is endured.

DISCUSSION

DR. VIRGIL E. SIMPSON, Louisville: Alcohol in quantities prescribed as carefully as you would prescribe drugs of any sort, and that have a potentiality for harm, is not only a therapeutic agent, but it likewise has a place as a food. The objection to the use of alcohol as a food is that patients continue the use of alcohol not as a food, but as a beverage.

DR. W. W. ANDERSON, Newport: Alcohol has a place as a drug. It should be put under the same restraint of law that applies to other narcotics, belonging to the same class as opium, chloral and chloroform.

DR. W. E. SENOUR, Bellevue: It is the duty of every physician to lend his assistance to study this question by scientific analysis, and to cast aside the false theories, the stupid delusions, and false conclusions, and study for himself the laboratory experiments which are taking place throughout the land, and after doing so it is his duty in the interest of the children of this country and to posterity to carry the gospel to every home he visits.

DR. CURRAN POPE, Louisville: In the class of nervous and chronic invalids with whom I am thrown in daily contact, it would be suicidal to prescribe alcohol in any form. Occasionally in crises it seems as though it has been of some help, but in the ordinary everyday prescription for non-acute diseases, alcohol does not occupy a place. How many of you have the courage to tell a patient he shall not have your prescription refilled without the stamp of your approval? I never write a prescription of any kind that I do not stamp on it in red ink, "no copy, no repetition." We must be careful every time we write a prescription containing alcohol that we may not lay the foundation for alcoholism and for other drug addictions.

Uterine Myomata and Malignancy

DR. JOSEPH G. GAITHER, Hopkinsville: Uterine myomata are a serious menace to health, and although they may be quiescent for years, causing little trouble from either pressure or hemorrhage, yet they slowly poison the musculature of the heart. Uterine myomata should never be given a chance to become sarcomatous, but as soon as they reach sufficient size to give symptoms they should be removed.

Enuresis in Children

DR. N. W. MOORE, Cynthiana: Each case should be studied closely with an effort to find the cause or causes responsible for this condition, and in many instances when found the enuresis can be relieved or cured. If a careful examination shows that there is no malformation or central nervous lesion to deal with, the urine should be examined. A hyperacid urine should be treated by a milk diet and no meat, and the administration of potassium citrate after each meal. If the urine is alkaline, leave meat in the diet and give either hexamethylenamin or benzoate of ammonium in 4-grain doses after meals. After the urine has been brought to a normal condition, tincture of belladonna in increasing doses is the drug which will prove most valuable. It should be given a long time—from three to six months being required in some cases—for a complete cure. If the urine contains bacteria, hexamethylenamin should be administered; in mixed infection salol and possibly vaccine therapy.

Trachoma in Eastern Kentucky

DR. J. A. STUCKY, Lexington: Education should be more widely attempted by means of home-instruction, lectures, demonstrations, moving-picture shows, etc. Insofar as practicable each house should be restricted to the use of but one family, thus avoiding overcrowding. Hospital facilities should be provided for the reception of people suffering from severe trachoma. Sufficient authority should be granted to require them to undergo such treatment when they are a menace to the public health. In each infected sanitary district a dispensary should be provided for the treatment of cases of trachoma not requiring hospital care. A sufficient number of field nurses should be provided to administer, under the direction of the physician, home treatment and instruction to those who cannot be sent to the hospital or attend the dispensary. No children suffering from trachoma should be admitted to uninfected schools. Separate schools, where practicable, should be established for trachomatous children. All boarding schools where trachomatous pupils are admitted should be provided with adequate facilities for the care and treatment of trachoma, such facilities to include the permanent services of a nurse trained in the care and treatment of diseases of the eye.

Periodic Examination of Supposedly Well Persons

DR. EUGENE LYMAN FISK, New York City: The fact that an ordinary group of people, at an average age of 30, taken, not from a hospital, but from one of the leading business institutions of the world, is found suffering from so many disabilities which can be corrected, checked or cured, points

a way to sensible, practical and easy methods of distinctly raising the general level of the vitality and well being of the race, which so many people, even life-insurance experts, have thought was a fixed and unalterable quantity. It should be remembered, however, that while saving the unfit, we are also improving the so-called fit, which is a powerful influence in keeping ahead of the game.

(*To be continued*)

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

Twenty-Seventh Annual Meeting, held at Buffalo, Sept. 15-17, 1914

(*Concluded from page 1321*)

Myomectomy with Extensive Resection of the Uterus in Fibroid Tumors

DR. X. O. WERDER, Pittsburgh: A comparison of the mortality of hysterectomy and myomectomy would seem to be rather in favor of the latter according to my experience. Since 1898, inclusive, 707 cases of uterine fibroids have been operated on by me with a total mortality of 3.25 per cent. This does not include over a hundred cases in which small fibroids were removed coincident with other operations, but only those in which this neoplasm constituted the principal indication for operation. In these 707 cases, hysterectomy was performed 536 times and myomectomy 171 times. The total mortality in the latter cases is 4, or 2.33 per cent., while hysterectomy was accompanied by a death rate of 3.45 per cent., or more than 1 per cent. in favor of myomectomy. The morbidity of myomectomy also compares even more favorably with that of hysterectomy, as the myomectomy patients almost uniformly make a smooth, uncomplicated recovery, and almost without exception enjoy perfect health after the operation; they are, in fact, among the most satisfactory cases in my experience. I feel justified, therefore, in making a plea for more conservative treatment of uterine fibroids in younger women than they now receive.

DISCUSSION

DR. J. HENRY CARSTENS, Detroit: When a young woman has one or two fibroids, I perform myomectomy. If she has a number of small ones, I am inclined to remove the uterus. In some cases I have taken out one side of the uterus, about one-half, but have not tried systematically to save any uterine tissue by taking away half of it or one-quarter or three-quarters. It is a matter of very little consequence whether we take it all away or half of it, if the ovaries are intact. Whether or not this woman menstruates afterward is of no great moment, because I do not think menstruation is of benefit to these women. The question of ovarian secretion is all important, and if you leave the ovaries the woman will go on and never know whether the uterus is out or not, except that she does not menstruate every month.

DR. ROBERT T. MORRIS, New York: There is one important factor which we are apt to forget, and that is the patient herself. Ask her what she wants. I say to a patient who has these small masses, "If we do a myomectomy, remove a part of the uterus and leave a part, you will probably have a further development of this neoplastic growth because the original conditions persist. If you want me to leave a part with the possibility of having further neoplastic growths develop, with the idea of having a child, all right." I leave it to the patient.

DR. HUGO O. PANTZER, Indianapolis: The importance of Dr. Werder's contribution lies in the fact that he has materially lessened the mortality by not removing the entire uterus. To me that is a very strong and sound argument in favor of myomectomy as against a more radical operative procedure.

DR. JULIUS H. JACOBSON, Toledo, Ohio: Last year, when abroad, I was impressed with the number of patients with sloughing fibroids who were operated on, patients in whom the Roentgen-ray treatment had been applied, so I came to the conclusion that these cases treated with the Roentgen ray give a larger mortality than if we operate on these patients when the fibroids are smooth, when we can do myomectomy or hysteromyomectomy.

DR. A. B. MILLER, Syracuse, N. Y.: I have had six cases of fibroid tumors in women of advanced age that have been treated with the Roentgen ray with very good results.

Abdominal Distention Following Operations on the Pelvic Viscera

DR. FRANCIS REDER, St. Louis: The most encouraging measures at our disposal are embodied in the stomach lavage and in the enema. The former should be used every four to six hours while the patient continues to vomit, whereas in the latter it may be said that our greater hope rests. The alum enema of Hardon, slowly introduced into the rectum every two hours, if necessary, has proved so efficacious that I have given it the preference over all enemas. The alum is not irritating to the bowel, so that a large number can be administered provided the nurse exercises gentleness.

Two Cases of Cancer of the Uterus Apparently Cured by Postoperative Infection

DR. JOHN W. POUCHER, Poughkeepsie, N. Y.: In both these cases the laboratory reports showed the disease to be adenocarcinoma, and in neither of them could I claim to have removed all the diseased tissues; consequently the cure must be attributed to some other cause, namely, the suppuration and the formation of a toxin that destroyed the cancer cells. There are areas of broken-down tissue filled with masses of dead cancer cells. The operation opened up fresh fields for their absorption. May we not have here a genuine auto-inoculation of dead or modified cancer germs? In the literature I find several instances of spontaneous cures of cancer, and several pathologists with whom I have discussed this subject say they have found post-mortem evidences of such cures.

Operations at the Home; When and Under What Circumstances Are They Justifiable?

DR. J. E. SADLIER, Poughkeepsie, N. Y.: In my surgical work in the hospital covering a period of twelve years, 1902 to 1914, and with an average of 60 per cent. abdominal work, there was a mortality of 3.4 per cent. The average mortality during the past three years was 2 per cent. No attempt was made to exclude any properly operative case, and all patients dying in the hospital regardless of when or what complication were included. After a careful and exhaustive study of my results when operation was done at the home, covering the same period of twelve years, I find that the mortality is 4.3 per cent. When we consider that the cases in which operation was performed at home represent the severest type, and that the performing of elective surgery at the home was discouraged, I think that the foregoing statistics, covering several thousand hospital and home cases, in about 20 per cent. operation being performed at home, speak for a fair amount of safety for the home operation.

Treatment of Puerperal Thrombophlebitis

DR. JAMES F. BALDWIN, Columbus, Ohio: I have had four cases with one death. Williams advised ligation of the veins only, while Jellett resected the involved veins. I recommend instead hysterectomy with ligation of the arteries only, the veins being left wide open for drainage into a gauze fluff which fills the pelvis and is brought out through the vagina, the sigmoid being sutured all around to the pelvis so as completely to isolate the peritoneal cavity. This gives the fullest drainage with the least trauma, and removes the original source of infection.

Resection of Ovaries

DR. ALBERT GOLDSPOHN, Chicago: This procedure is almost wholly an incidental or auxiliary one, to be done when abdominal section is needed for other reasons, chiefly for displacements of the uterus, freeing of adhesions, and removal of neoplasms from the uterus or its adnexa. The objections to it are theoretically (*a*) that all the hydropic graafian follicles and follicle cysts of any size do or may contain ova,

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and, therefore, being physiologic structures, should be left alone. This assertion was soon proved to be unwarranted and untrue by numerous investigators of the histology. (*b*) That these follicle cysts and cystic corpora lutea cause no symptoms has been abundantly disproved by clinical experience by unbiased observers. Pain continues from such resected ovaries, too frequently, and secondary operations are too often needed for their removal. This has likewise been demonstrated to be untrue by several operators, aside from my own experience. According to newer studies, these follicle cysts and persistent corpora lutea sometimes give rise to hemorrhages, even of a fatal nature; likewise, they may furnish an atrium for infection by bacteria or neoplasms. In my paper I point out the kinds of ovaries that are best suited for resection and the feasibility of saving ovarian tissue from the wall of larger ovarian cysts. Elevation or suspension of ovaries to relieve venous engorgement is of equal importance and must not be omitted after resection. It is important to adopt a strictly aseptic technic and the use only of fine and readily absorbable suture material.

The following papers were also read: "Abdominal Drainage," by J. W. Keefe, Providence, R. I.; "Some Thoughts and Views on the More Common Gynecologic Conditions Necessitating Operation," by W. H. Humiston, Cleveland; "Some Observations on the Technic of Intestinal Anastomosis, with Special Reference to a Modification of Maunsell's Method," by F. D. Gray, Jersey City; "Mineral Springs of Saratoga," by D. C. Moriarta, Saratoga Springs, N. Y.; "Biliary Surgery," by J. F. Erdmann, New York; "Transverse Involution of the Colon; a Technical Step in the Short-Circuiting Operation," by R. T. Morris, New York; "The Statistics of Labor in Elderly Primiparas," by J. R. Freeland, Pittsburgh; "The Treatment of Abortion on the Basis of Its Pathology," by C. W. Barrett, Chicago; "Kinetic System and Treatment of Peritonitis," by G. W. Crile, Cleveland; "End-Results after Operation for Displacement of Uterus, Bladder and Rectum," by H. A. Wade, Brooklyn; "Ruptured Gastric and Duodenal Ulcer, by E. A. Vander Veer, Albany, N. Y.; "Repair and Reconstruction of Bile-Ducts," by J. H. Jacobson, Toledo, Ohio; "Pyloric Stenosis," by C. L. Bonifield, Cincinnati; "Treatment of Urinary Calculi Based on Chemical Composition," by C. B. Schildecker, Pittsburgh.

AMERICAN ROENTGEN RAY SOCIETY

Fifteenth Annual Meeting, held in Cleveland, O., Sept. 9-12, 1914

(*Concluded from page 1323*)

SYMPOSIUM ON GASTRIC AND DUODENAL DIAGNOSIS

Cinematography of the Stomach and Duodenum

DR. A. HOWARD PIRIE, Montreal: This process is so complicated that it is never likely to be a routine method of examination. Nevertheless, in certain cases it is worth the time, labor and expense. I use a specially constructed table, and make sixteen exposures on one plate for thirty-two seconds, insuring a complete stomach cycle. Taking the usual time as twenty-two seconds for a stomach cycle, I get eleven views of the stomach during the twenty-two seconds. These are for practical purposes sufficient to show all the movements of the stomach in order to form a diagnosis. I make cinematographic views of doubtful cases.

Negative Diagnosis of Surgical Lesions of Stomach and Cap

DR. LEWIS GREGORY, New York: In thirty cases in which operation was performed by nineteen different surgeons, and in which a negative diagnosis of ulcer or cancer of the stomach or cap had been made solely on the roentgenologic findings in not a single instance was a lesion demonstrated by the surgical exploration. In twenty-nine out of the thirty cases the surgical findings corresponded with the Roentgen findings in every essential detail, but in one case they differed to such an extent that it was impossible to explain the difference.

Observations from the Study of a Thousand Gastro-Intestinal Cases

DRS. ARIAL W. GEORGE and ISAAC GERBER, Boston: Gall-bladder disease is detected either by showing an enlarged gall-bladder, adhesions to the duodenum, gastric antrum, hepatic flexure or transverse colon, and, finally, by the direct demonstration of gall-stones. Care must be taken that the parts are quiet; not only must the patient himself be still, but the plates must be taken rapidly enough so that the entire gall-bladder is at rest in the true sense of the word. A large number of plates must be taken. Frequently the very last plate of a series will be sufficient to make a positive diagnosis of stones, when all the others merely gave "suspicious" evidence.

We believe that all gall-stones will show on the Roentgen plates. In every single case in which gall-stone plates were later carefully studied we were always able to see the shadows of the gall-stones. The trouble was not with the Roentgen method. The trouble was with our own acuteness of observation at the time of the preoperative diagnosis. The problem of the future, then, is to learn to recognize these shadows which the Roentgen rays will surely produce. When this can be done, then 100 per cent. of gall-stone diagnoses will be made.

DISCUSSION

DR. L. T. LE WALD, New York: There are cases of pylorospasm which we must recognize, and many of them are surgical conditions, because they cannot be relieved unless the pylorus is divided. I have seen five such cases. I do not believe that these cases are associated with chronic appendicitis, as is generally supposed. I think some of these cases are neuropathic in origin.

DR. GEORGE C. JOHNSTON, Pittsburgh: I like to examine these cases fluoroscopically first, and then make roentgenograms. I think that with Dr. Pirie's method we should be able to get better results than we have heretofore.

DR. A. F. HOLDING, New York: The amount of indefiniteness and inaccuracy in this work varies directly as to the amount of time spent on the examination.

DR. A. M. CRANE, Kalamazoo, Mich.: It has been said here that all gall-stones would have a shadow on the plate, but that has not been my experience. If we have a pure cholesterin stone, it cannot be seen on any plate, because it does not offer any resistance to the ray different from the tissues around it.

DR. GEORGE E. PFAHLER, Philadelphia: I do not think that any one ever asserted that all gall-stones could be shown. Our present technic does not enable us to do that. As to the pure cholesterin stones, only 0.5 per cent. of all gall-stones are of that type, and about an equal number are pure calcium carbonate stones. The composition of the stone, the weight of the patient, and the density of the tissues all enter into the question. Gall-stones are more frequent in some localities than in others, and the calcium content is probably also greater in some localities than in others, just as is the case with kidney stones. But I am sure we shall all find more gall-stones if we will look for them more carefully.

DR. E. H. SKINNER, Kansas City, Mo.: I do most of my work fluoroscopically, although I do make roentgenograms in every case so as to be able to show the doctor something of the case. It is not easy to describe the full scope of the possibilities of the fluoroscope. Many of the conclusions arrived at by serial roentgenography could also be obtained with the fluoroscope.

DR. F. J. PALMER, Rochester, N. Y.: A year and a half ago I started in doing fluoroscopic work, and now eight-tenths of my work, whether I make a negative or a positive diagnosis, is made with a screen entirely.

Operative Indications in Gastro-Intestinal Lesions: A Study of One Hundred Cases in which the Roentgenologist was Present at the Operation

DR. LEON THEODORE LE WALD, New York: The roentgenologist after determining the organic nature of a lesion, such as hour-glass deformity of the stomach, should not rest there. He must go further. He must determine the exact size and shape of each pouch, the time it takes each pouch to empty,

whether or not any other lesion, such as ulcer, is present in some other part of the stomach or duodenum, and he must ascertain the condition of the remainder of the digestive tract. On the accuracy of his findings, the kind and extent of operative procedure will largely depend. If he has overlooked a pyloric stenosis (even though it be only spasmodic), and a surgeon performs only a gastrogastrostomy, instead of a gastro-enterostomy, the result will not be a complete cure. Likewise, if the surgeon operates without a complete Roentgen examination having been made, or without due consideration of all aspects of the findings, the best results may not be obtained. In fact, the closest cooperation between the roentgenologist and the operator is essential to the securing of the best results to the patient. It is even wise, if possible, for the roentgenologist to be present at the operation, in order that his opinion may be obtained on doubtful points which may arise in complicated cases during the course of the operation.

Early Diagnosis of Pulmonary Tuberculosis

DR. FRANK S. BISSELL and DR. ERNEST T. F. RICHARDS, Minneapolis: Pulmonary tuberculosis should be suspected in all cases presenting obscure symptoms suggesting a low-grade intoxication. The Roentgen method offers the only possible means of diagnosis in these cases, and the only means of immediate corroboration of the Roentgen diagnosis at present available, is the subcutaneous tuberculin test. While, for many reasons, it would be a desirable consummation to eliminate the tuberculin test and rely entirely on the objective signs offered by the Roentgen rays, this is not practicable until we have very definite proof that such signs are pathognomonic. The present series of cases offers some evidence that there are pathognomonic Roentgen signs of this disease, but this evidence must be supported by a great many more controlled cases. All Roentgen signs of disease must be founded on a sound pathologic hypothesis. Hilus tuberculosis is usually secondary to a focus in the lung. The primary focus may occupy any area in the lung field, but is particularly prone to elect certain points near the apex of any lobe.

Roentgen Studies of Acute Small Intestine Obstruction

DR. JAMES T. CASE, Battle Creek, Mich.: Owing to the gas and fluid distention of the bowel it is possible to differentiate roentgenologically between acute obstruction in the small or large bowel at a glance without giving the patient any opaque salt by mouth. Judging by the disposition and relations of the distended coils one may estimate closely where in the small bowel the obstruction has occurred. No harm has been noted in cases in which barium by mouth was used, and where the case is under observation for several hours, it is helpful to administer a few drams of bismuth. The barium enema will aid in the recognition of intussusception and colonic obstruction. The progress of an obstruction may be estimated by comparing roentgenograms made at successive observations when diagnosis is in doubt. Operation is not unnecessarily delayed in any of these cases for the examination need not occupy more than a very few minutes. The patient is simply lifted onto the stretcher and carried to the Roentgen-ray room. There the stretcher is transferred to the horizontal fluoroscope, the proper field found with the screen, a plate superimposed and a flesh exposure made. The patient is then returned to bed without further manipulation or inconvenience than is required to lift him onto the stretcher and back again.

DISCUSSION

DR. L. T. LE WALD, New York City: In a case of intussusception the clinical diagnosis located the lesion on the left side. A bismuth enema traveled all the way to the cecum and one could see the gas content of the distended loop of ileum overlapped by the injection. No tumor could be felt in this case even when the patient was anesthetized. The roentgenogram made it possible for the surgeon to make his incision directly over the intussusception. In another case the obstruction was easily shown in the roentgenogram at the ileocecal valve region, the small intestine being much distended. The cause was an acute appendicitis, producing an inflammatory exudate, which obstructed the lower ileum.

DR. H. K. PANCOAST, Philadelphia: I had one case in which I doubt that the diagnosis could have been made without the aid of a roentgenogram. The distended loops of intestine proximal to the site of obstruction in the small bowel easily located the lesion. In another case 5 pints of fluid had to be aspirated before anything at all was done toward obliterating the obstruction.

DR. PAUL EISEN, Chicago: In one case which I roentgenographed and located the seat of obstruction, the operation disclosed a band, ⅛ inch thick and 4 inches long, extending across the abdomen and strangulating the bowel. In another case the small intestine was seen in the roentgenogram to be contained in a femoral hernia, causing intestinal obstruction. The obstruction was relative, not absolute.

DR. JAMES T. CASE, Battle Creek, Mich.: In a number of cases the loops of bowel were filled with fluid above the bismuth. Much can be learned by studying the gas-distended coils of intestine.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Public Health, Boston

August, IV, No. 8, pp. 633-720

1 Applications of Water Analysis. E. Bartow, Urbana, Ill.
2 Value of Routine Water Analysis in Sanitary Surveys. H. E. Barnard, Indianapolis.
3 Alaskan Eskimo. J. A. Watkins, Washington, D. C.
4 Relation of Public Health to Race Degeneracy. J. H. Kellogg, Battle Creek, Mich.
5 All Typhoid of Community for Five Years from Carrier Through Milk. H. W. Hill, London, Ont.
6 Analysis of Cost Keeping as Applied to Municipal Management of Street Cleaning. F. C. Bamman.
7 Recent Progress in Methods and Character of Street Cleaning. S. Whinery, New York.
8 Uniformity in Annual Reports of Local Boards of Health. F. L. Hoffman, Newark, N. J.
9 Period of Incubation of Diphtheria Cultures. H. Albert, Iowa City, Ia.
10 Use of Hypochlorite Capsules for Treatment of Small Quantities of Drinking Water. H. A. Whittaker, Minneapolis.

September, No. 9, pp. 721-818

11 Chemical and Bacteriologic Study of Wrapped Bread. B. R. Jacobs, J. A. LeClerc and M. L. Mason, Washington, D. C.
12 What States and Cities of United States Are Doing in Public Health Education Work. H. Greeley, Brooklyn.
13 Pottery Industry and Its Relation to Tuberculosis. H. R. M. Landis, Philadelphia.
14 Sewage Disposal Problem in Villages and Small Cities. G. C. Whipple, Boston.
15 Scarlet Fever. E. H. Place, Boston.
16 Relation of Biologic Therapy to Public Health. G. H. Krall, New York.
17 Yellow Fever in Mexico. E. Liceaga, Mexico City.

Annals of Otology, Rhinology and Laryngology, St. Louis

June, XXIII, No. 2, pp. 273-522

18 *Anaphylactic Reactions Occurring in Horse Asthma and Allied Conditions. J. L. Goodale, Boston.
19 Intranasal Operation for Relief of Nasolacrimal Stenosis. E. M. Holmes, Boston.
20 Evolution of Tonsillotome. S. A. Friedberg, Chicago.
21 Chronic Influenza of Nose and Throat. L. B. Lockard, Denver.
22 Study of Vincent's Angina. J. J. Richardson, Washington, D. C.
23 Case of Cavernous Sinus Thrombosis Complicating Suppurative Labyrinthitis. A. Braun, New York.
24 Nasopharyngeal Myxosarcoma; Several Operations and Final Spontaneous Recovery. E. F. Ingals, Chicago.
25 How Patient Can Help Himself in Cases of Chronic Catarrhal Otitis Media. S. H. Lutz, Brooklyn.
26 Two cases of Sarcoma of Dura Mater Arising in Vicinity of Mastoid Process, with Vague Symptoms Simulating Mastoiditis. J. F. Barnhill, Indianapolis.
27 Case of Latent Mastoiditis Complicated by Toxic and Irritative Cerebral Symptoms, Blindness and Streptococcemia. S. Kopetzky, New York.
28 Sinus Operation: Resection of Internal Jugular Vein; II. Ligation of Internal Jugular Vein. M. D. Lederman, New York.
29 Nitrate of Silver Applied within Mouth of Eustachian Tube for Relief of Tinnitus. W. C. Braislin, Brooklyn.
30 Temporosphenoidal Abscess Secondary to Chronic Suppurative Otitis Media. J. M. Ingersoll, Cleveland.

31 Diffuse Serous Labyrinthitis Complicating Acute Purulent Otitis Media. E. Danziger, New York.
32 Case of Simultaneous Bilateral Cavernous Sinus Thrombosis Twelve Hours after Simple Mastoid Operation. I. Friesner, New York.
33 Cerebellar Abscess. C. E. Perkins, New York.
34 Meningitis without Definite Symptoms Occurring Late in Mastoidectomy Convalescence. G. E. Steel, New York.
35 Variations of Sphenoid Sinus Disease. G. M. McBean, Chicago.

18. **Anaphylactic Reactions in Horse Asthma.**—In five patients with horse asthma the application of horse-serum to an abrasion of the skin produced within a few minutes sharply localized edema and reddening. In three of these cases the introduction of horse-serum in the nose caused edema of the nasal mucous membrane, together with profuse watery discharge and sneezing. One case of horse fever without asthma gave a delayed reaction to the nasal test (although this was reported and Goodale cannot vouch for it), but was negative for the skin test. A similar case gave a delayed but definite reaction to the skin test, but showed no nasal symptoms. Four of the horse-fever cases without asthma were negative for both tests. It is worth noting that in two cases, one patient who had horse asthma, reacted markedly to both tests, the other patient whose vasomotor symptoms from horses affected the nose alone, showed no reaction. Six cases of bronchial asthma and five cases of hay-fever were negative for both tests. Three cases without vasomotor symptoms which had received immunizing doses of antitoxin several months previously showed no reaction to the tests.

The results of Goodale's experiments indicate that a localized anaphylactic reaction from horse-serum may be occasioned in certain individuals who experience asthmatic disturbances from the neighborhood of horses. The severity of these vasomotor symptoms appears to be a determining factor in the production of the reaction, since patients with nasal symptoms alone do not appear to be sufficiently sensitized to horses to give an immediate positive skin test.

The number of cases thus far tested is, in Goodale's opinion, too small to justify definite conclusions in regard to the value of these tests in detecting the existence of a state of sensitization to horse-serum, but if further studies should confirm them they should prove to be of assistance to the physician who is in doubt whether in a given case it is safe to administer antitoxin. It is therefore suggested by Goodale that a preliminary skin test with horse-serum be made in all patients who have previously received an injection of antitoxin derived from horses, whether tetanus, diphtheria or plague serum. Furthermore, in all patients who are about to receive antitoxin for the first time, inquiry should be made as to whether they have ever been disturbed by asthmatic symptoms when in the neighborhood of horses, and if so they should first be tested. So far as these experiments go, they would indicate that in horse asthma a dangerous anaphylactic shock may occur after the hypodermic administration of horse-serum. In horse fever with nasal symptoms alone, this danger is less or not at all to be feared, and in other types of asthma and of vasomotor rhinitis it is not present.

Annals of Surgery, Philadelphia

September, LX, No. 3, pp. 281-408

36 *Course of Acquired Disease of Thyroid and Principles which Seem to Control Its Progress. J. Rogers, New York.
37 How Shall Clinician Interpret Wassermann Reaction? W. H. MacKinney, Philadelphia.
38 *Pathology, Diagnosis and Treatment of Seminal Vesiculitis. B. A. Thomas and H. K. Pancoast, Philadelphia.
39 *Treatment of Bladder Papilloma by High Frequency Destruction. A. A. Uhle, Philadelphia.
40 Clinical Manifestations of Polyps of Male Urethra. A. Randall, Philadelphia.
41 *Method of Treating Adherent Perforating Ulcer of Posterior Wall and Lesser Curvature of Stomach. E. Archibald, Montreal, Que.
42 Congenital Pyloric Stenosis. A. J. Walton, London.
43 Diffuse Lymphangio-Endotheliomatous Growths of Peritoneum. T. S. Tirumurti, Madras, India.
44 *Tumor at Meatus Urinarius in Female. B. Tenney, Boston.
45 Traumatic Intra-Acetabular Separation of Pelvic Bones (Epiphyseal Diastasis in Acetabulum.) H. Neuhof, New York.
46 *Preparation of Dry Bony Areas for Skin Grafting. C. H. Mayo, Rochester, Minn.
47 Thumb Forceps to Facilitate Anastomosis. A. N. Collins, Duluth, Minn.

36. **Acquired Disease of Thyroid, Principles Which Control Its Progress.**—Rogers has observed sixty-two patients who applied for relief after one or more partial thyroidectomies. Only the minority had failed to show any benefit and a considerable part of this minority stated that they were worse than before the operation. An analysis of all these cases, however, has failed to yield any definite rules for avoiding poor results. Thirty-eight, for example, showed the presence of exophthalmos, and twenty-four did not, though some of them said that it was present formerly. Tachycardia was present and so had not been relieved in thirty-five. Eight of these were later subjected to more extensive thyroidectomy and five were thus cured of their rapid heart action. If enough of the gland is ultimately removed, or removed in successive stages, the pulse-rate can evidently be reduced, but it probably cannot be reduced by removing more than two-thirds of the gland at once. The worst results in these sixty-two cases seemed to have occurred in subjects who were operated on before they had attained their maximum growth and development; that is, before the age of 25, and in those who had small goiters.

All of the sixty-two patients complained of a greater or less amount of asthenia, or inability to expend the normal amount of mental and physical energy, and a considerable majority showed a blood-pressure above 140 mm. of mercury, and it is noticeable that the few Rogers has been able to follow have from year to year shown a more or less steady increase in their blood-pressure. A large proportion of these cases have shown some signs he interprets as those of hypothyroidism, although many in conjunction with the hypothyroidism have presented a more or less constant tachycardia.

With the exception of the few successful, or partially successful, secondary thyroidectomies, the only treatment which Rogers has found beneficial in these cases has been rest in combination with organ therapy. The most frequently useful agent, especially for those with high blood-pressure, has been the adrenal proteins which contain no adrenalin. The pituitary, the thymus or the pancreas have seemed indispensable for the relief of others. The indications for the particular organ have been ascertained by experiment in each case. A few seemed most relieved by a combination of thyroid with some other organ feeding.

The impressions derived from these experiences are summed up as follows: That partial thyroidectomy is to be especially avoided in patients who have not completed or have just completed their growth and development; that it is to be avoided in symmetrically enlarged thyroids as these seem peculiarly prone to relapse even after a considerable period; that it is be avoided in subjects of the very "nervous" type; that patients with marked exophthalmos of long duration bear any operation badly and can seldom be more than moderately improved.

38. **Seminal Vesiculitis.**—Thomas and Pancoast claim that chronic seminal vesiculitis is a far more prevalent disease than the average physician surmises, and masquerades under a manifold symptomatology, finding its expression ofttimes remote from the urinary tract; the inflammation is invariably due to a mixed infection, from which in its chronic state it is commonly impossible to isolate the gonococcus. The disease, analogous to pus-tubes in the female in many respects, presents serious and similar problems from the standpoint of treatment, and is not accorded the consideration that its medical importance demands. The particular treatment in any given case should depend on the anatomico-pathologic state of the vesicles, ejaculatory duct and vas deferens. This can be determined by proper vesicular palpation, massage and microscopic examination, supplemented when necessary by vasopuncture and collargol radiography. Experienced massage will in the majority of patients suffice to effect a cure in due time; in many, however, massage having proved ineffectual, convalescence may be accelerated by vasopuncture, vasostomy and direct medication of the seminal vesicles; in certain cases, not so few as may be imagined, seminal vesiculotomy or vesiculectomy should and must be performed if these patients are to be cured or relieved of their annoying symptoms.

Bilateral vasopuncture and collargol medication has resulted at least in the temporary cure of a number of cases of persistent chronic seminal vesiculitis. Collargol roentgenograms in a series of normal and pathologic cases have demonstrated, (a) by comparions *in vivo* and *in vitro*, the graphic portrayal of an ejaculatory duct sphincter; (b) the intimate relationship between the ureter and seminal vesicle, whereby ureteral irritation and urinary obstruction may occur in the event of an enlarged and inflamed vesicle; (c) the presence of stricture or obstruction of the vas; (d) congenital anomalies of the vesiculae seminales; (e) inflammatory enlargements of the vesicles, especially loculated collections of pus or seminal pyovesiculosis.

39. **High Frequency Treatment of Bladder Papilloma.**—A brief analysis of Uhle's eight cases shows that hematuria, intermittent or constant, is the most prominent, frequently the only symptom present. It is also interesting to note that it was of a terminal type in two cases. That hematuria, unfortunately, is still regarded as a disease, and not a symptom of some condition, usually a severe one, of some part of the genito-urinary tract, is evidenced by the fact that most of the patients were treated internally for some time, and no attempt was made definitely to locate the cause and site of the hemorrhage. The symptomatology is at times misleading, as symptoms may be referred to one organ, when the actual source of disease is another.

Uhle states that high-frequency destruction of benign growths of the bladder is a very effective method of treatment, even when the bladder is extensively involved. Recurrences are frequent after any method of treatment, therefore cystoscopic examinations at stated intervals should be advised in every case of bladder papilloma. The immediate effects in malignant growth of the bladder are apparently good, as is shown by the diminution in the size of the growth and cessation of hemorrhage, but a cure should not be expected; at least, this has been his observation with these few cases.

41. **Treatment of Perforating Ulcer of Stomach.**—When in July 1913, a case came under Archibald's care, in which excision was practically out of the question, and a posterior gastro-enterostomy was impossible on account of adhesions, he carried out an exclusion of the ulcer-bearing area by tying off the stomach above the ulcer with a fascial strip taken from the anterior sheath of the rectus, passed through a slit in the great omentum, about 1 cm. above the upper limit of the inflammatory mass. On tightening the ligature and securing it with a few silk stitches, the stomach was found to be tied off about its middle, forming an artificial hourglass stomach. An anterior gastro-enterostomy was performed in the cardiac half of the stomach at a point of the jejunum about 12 inches from the duodenojejunal juncture. The stoma was about 2 inches above the greater curvature, about a third of the way from the greater to the lesser curvature. The abdomen was closed without drainage.

A bismuth meal was given during the last week in August. After four hours, a trace of the bismuth was seen at a point toward the pyloric side of the ligature, and it was thought that the ulcer must have burrowed through and established some slight communication with the cardiac half of the stomach. It became clear at post mortem that this must have been a slight overflow of the bismuth through the opening afforded by a partial yielding of the fascial ligature.

In view of the persistence of symptoms, and the progressive loss of weight and strength of the patient, the abdomen was reopened through the old scar August 28. There were extensive adhesions of the wall of the stomach and the jejunal loop, together with the gastrocolic and gastrohepatic omenta to the anterior abdominal wall. These were all freed, though with some difficulty. It was found that the anastomosis was patent for two fingers at least; that the band of fascia was apparently holding and that the distal portion of the stomach was slightly distended, although not abnormally so. The ulcer was buried in adhesions high up under the ribs, and the cardiac portion of the stomach seemed to bulge over toward the midline so as partly to cover the area. It was impossible to tell whether the ulcer had burrowed its way into the proximal part of the stomach or not.

It was decided to do a second gastro-enterostomy as near the greater curvature as possible. Owing to the difficulty of pulling the stomach forward from under the ribs, it was impossible to get a stoma of more than 1¼ to 1½ inches. This operation failed to relieve the patient's pain or vomiting, and she went steadily down hill, vomiting several times a day, and occasionally vomiting a good deal of blood—sometimes pure blood. On September 5 a jejunostomy was done under local anesthesia, for the purpose of feeding. In the evening after the operation she had a large hematemesis. This was repeated on the second day following, and on September 7 she died of inanition and hemorrhage.

The post mortem revealed an ulcer of large size, almost quite round, with thickened walls, and over its floor coursed a large vessel in which was found an opening large enough to admit a small probe. Clearly it was from this point that the repeated hemorrhages had come. The gastro-enterostomy openings were healed and patent. The fascial ligature had yielded to the extent of admitting the tips of three fingers in the opening joining the cardiac with the pyloric portions. The ulcer measured 5 cm. in both diameters, and the tissues of the stomach wall were thickened to the extent of about 1½ cm. The wall was perforated at the base of the ulcer, and the bed was formed by the pancreas. The pancreatic substance itself was not invaded. The cardiac half of the stomach showed a pouching below the two gastro-enterostomy openings, somewhat analogous to the pouching of the bladder behind an enlarged prostate, and this clearly accounted in part for the retention of the stomach contents.

44. **Tumor at Meatus Urinarius in Female.**—According to Tenney there are six conditions under which tumor may appear at the female meatus. Papillary adenoma—dysuria, pain with physical contact, sometimes slight bloody staining. Not larger than 1 cm., and usually smaller, usually single, varying shades of red, attached on one side of canal and usually the posterior, uncommon, except between 15 and 40 years, rarely malignant, frequently recur after removal. Prolapse of dilated ureter—dysuria, pollakiuria. Tumor cyst like a flaccid mucous membrane, "size of thumb" or less, appearing either within a few weeks of birth or after months or years of vesical irritation and one-sided symptoms. Probe can be passed all around the pedicle except for one spot. Sometimes mouth of ureter can be identified. Constant tenesmus. Prolapse of bladder tumor—hematuria, dysuria, pollakiuria. Size and structure must vary. Rare in children. Tumor follows long train of bladder symptoms. Prolapse of urethra—symptoms like papillary adenoma except for absence of pain and tenderness. In one case came out ⅝ of an inch. Prolapse of bladder mucosa—only recorded case had symptoms corresponding to intravesical stricture and dilatation of ureter followed by appearance of a fold of mucous membrane at the meatus. Prolapse of bladder wall—pain, tenesmus, spasm and incontinence at intervals preceding appearance of tumor. Tumor "size of cherry" to "size of duck's egg," tender, purple, pyriform in shape, bleeding on handling. Sometimes ureteral orifices can be identified on the back of tumor. May be reducible or not. May occur in infants as results of imperfect sphincter apparatus or in adults after injury to same.

46. **Preparation of Dry Bony Areas for Skin Grafting.**—By means of a small drill Mayo perforates the entire dry area of bone like a sieve, or cribriform plate, all over its surface. These perforations are about 1/25 of an inch apart and penetrate to the diploe of the skull or to the blood-supply of the bone involved so that each perforation shows a slight hemorrhage. Through these perforations, granulations are rapidly thrown out and soon merge together on the surface, allowing an abundant blood-supply for the skin grafts.

Archives of Internal Medicine, Chicago

September, XIV, No. 3, pp. 289-452

48 Second Progress Report of Thompson-McFadden Pellagra Commission. J. F. Siler, P. E. Garrison and W. J. MacNeal, New York.

49 *Relation of Pellagra to Use of Certain Foods and to Location of Domiciles in Six Selected Industrial Communities. J. F. Siler, P. E. Garrison and W. J. MacNeal, New York.

50 *Nitrogen and Sulphur Metabolism in Cretin. I. Greenwald, New York.
51 *Lymphocyte Increase and Altitude. M. E. Stains, T. L. James, Colorado Springs, Colo., and C. Rosenberg, New York.
52 *Glycyl-Tryptophan Reaction in Meningitis. R. H. Major, San Francisco and E. Nobel, Vienna.
53 *Elliptical Human Erythrocytes. F. W. Bishop, New York.
54 *Pituitary Gland in Epileptics. J. F. Munson and A. L. Shaw, Sonyea, N. Y.
55 *Specific Rôle of Foods in Relation to Composition of Urine. N. R. Blatherwick, New Haven, Conn.

49. Relation of Pellagra to Use of Certain Foods.—The authors summarize the results of their very extended investigation as follows: Pellagra spread from a preexisting case as a center in the six villages studied. It was transmitted to new victims only through very short distances and chiefly to those immediately associated in the home with a preexisting case of the disease. Frequent use of corn-meal as an article of diet was not a factor in the causation of pellagra in these villages. There was discovered no evidence that canned goods have anything to do with the causation of pellagra. Frequent use, even daily use, of fresh meats and of eggs afforded no relative protection from pellagra in these villages. The daily use of milk seemed to diminish to some extent the danger of contracting pellagra in these mill villages in 1912 and 1913, although its use did not fully insure against the development of the disease.

50. Nitrogen and Sulphur Metabolism in Cretin.—Examination of the results of Greenwald's examination show few deviations from the normal. The absorption of nitrogen is poor. The ratio of ammonia nitrogen to total nitrogen is rather high. The creatinin output is very low, and a considerably greater amount of creatin is excreted. Aside from these the findings seem to be quite normal.

51. Lymphocyte Increase and Altitude.—The authors assert that at an elevation of 6,000 feet the larger lymphocytes are absolutely increased in the circulating blood by at least 20 or 30 per cent. in both man and monkey. The basophilic mononuclear elements in the blood of man at sea-level are approximately 34 per cent., and at 6,000 feet are about 42 per cent. The total white blood-cells per cubic millimeter are approximately the same at sea-level and at an altitude of 6,000 feet, namely, about 7,500. The total polymorphonuclear cells diminish in the exact proportion in which the mononuclear cells increase. The red corpuscles increase by 22 per cent. at an altitude of 6,000 feet.

52. Glycyl-Tryptophan Reaction in Meningitis. — The authors feel that in glycyltryptophan they have another valuable addition to our diagnostic measures in meningitis. In cases having a peptolytic index higher than 1 they have consistently found meningitis present. Only one case of tuberculous meningitis showed an index as low as 1. The striking variations in peptolytic powers which were observed frrom time to time makes it probable that cases showing a low index might at some time have shown a much higher one. Also there was noted an interesting tendency for the peptolytic powers of the cerebrospinal fluid to increase as the disease progressed.

53. Elliptical Human Erythrocytes.—The patient whose blood was studied by Bishop gave a typical history of acute appendicitis. No lesions of heart, kidneys or lungs were discoverable. Operation was performed two hours after the patient entered the hospital and a gangrenous appendix with a small amount of seropurulent fluid free in the abdomen, was found. Recovery was uneventful, the temperature being normal on the seventh day after operation and the patient being discharged cured on the tenth day.

During his stay in the hospital a careful study of his blood was conducted. About 75 to 80 per cent. of the erythrocytes were observed to be elliptical in outline. The proportion between the long and short diameters of these cells varied considerably, some of them being only slightly elliptical, while others were very distinctly elongated. The fragility of the erythrocytes was determined and found normal. Vital staining showed only 3 per cent. reticulated cells. —well within normal limits. The Wassermann reaction was negative. The possibility of this condition being a congenital characteristic of the man's blood suggested itself. Working on this theory the blood of his sister was obtained and was found to show an exactly similar condition. A few of them showed a more extreme deformity than those of her brother. As far as she could remember she had never had a sick day in her life.

The other members of the family—a second sister, her father and her two children (both boys)—were found to have normal erythrocytes; the mother of the patient is not living. To exclude the possibility of some chronic poisoning by lead, coal-gas, or other chemical, the blood of all persons living in the same house with this family was examined and found to be normal.

54. Pituitary Gland in Epileptics.—For some time the authors have been collecting material which might cast some light from an anatomic point of view on the conditions of the ductless glands in epilepsy. The thyroid and pituitary glands were the only ones showing any great change in appearance; both of these showed more or less variation from what might be considered an average or normal type.

The sella turcica has not as a rule been enlarged; ordinarily the gland has completely filled it. There has, however, been a distinct group of cases in which there has been a marked difference between the size of the sella and the size of the gland. In these cases the dura is seen pouched down into the sella, instead of the more usual flat membrane between the clinoid processes. When this pouching is found, the gland may be flattened (scaphoid) in shape, but small glands or large fossae may also account for the condition in different cases. In only one such case have they taken measurements of the sella; they were as follows: between anterior clinoid processes, 28.3 mm.; between posterior clinoid processes, 17.5 mm.; between optic foramina, 19.8 mm.; from optic foramen to posterior clinoid process, 15.5 mm.; width in sagittal plane, 15.5 mm.; depth, 16.6 mm. The gland itself in this case (A 416) measured 17.5 by 15.5 by 4.7 mm. The woman in whom this was found was decidedly fat; ovaries small and fibrous, uterus unicornus; age at death 44 years. Also, in a case of internal hydrocephalus, a much-pouched dura was found.

The twenty-two glands recorded in this paper appear to be somewhat below the average in size. No large *tumors* of the pituitary were found, but in three cases large tumor-like structures have been found. There were no clinical symptoms in any of these cases; the condition was not suspected, and thus significant clinical conditions may have escaped notice. One of the most striking variations in the appearance of sections of the pituitary is variation in the blood-content of the gland. In many cases it considerably exceeds the normal. All degrees are present and an uneven distribution of the congestion is not uncommon. No particular cell type can be said to predominate in the glands examined. There are occasionally glands in which the cyanophil cells are considerably more common than the average. There is also a distinct tendency toward an increase of connective tissue in the region between the neurogliar and glandular portions.

55. Foods in Relation to Composition of Urine.—According to Blatherwick the composition of the urine is markedly influenced by the character of the food intake. Foods which have a preponderance of basic elements lead to the formation of a less acid urine. Conversely, foods with a predominance of acid-forming elements increase the urinary acidity. Potatoes, potato ash, oranges, raisins, apples, bananas and cantaloups are very efficient in reducing the acid output. Tomatoes are of less value in this respect. Rice and whole-wheat bread increase urinary acidity. Plums, prunes and cranberries, although yielding a basic ash, nevertheless increase the acid formation. The latter foods contain benzoic acid, which increases the acidity owing to the formation of hippuric acid. An increase in H^+ is accompanied by a significant increase in the ammonia excretion. The authors' results indicate that ammonia exerts an unmistakable influence in the preservation of body neutrality. Titratable acidity and H^+ are closely related in behavior. A lack of relationship between H^+ and urine volume is pointed out. The solubility of uric acid in urine is closely dependent on the H^+. All urines with an acid reaction are supersaturated with

uric acid, while alkaline urines are capable of dissolving added uric acid. Further evidence for the interrelationship of the alveolar CO_2 tension and the H^+ of the urine is submitted and their dependence on diet is pointed out. The H^+ of the urines of thirty vegetarians was 6.64, in contrast with the value of 5.98, reported by Henderson and Palmer, for persons living on a mixed diet.

Arkansas Medical Society Journal, Little Rock

September, XI, No. 4, pp. 93-112

56 Tumors of Breast. St. C. Cooper, Fort Smith.
57 Vesicovaginal Fistula. A. Watkins, Little Rock.
58 Conservation Versus Stimulation in Treatment of Shock. C. S. Holt, Fort Smith.

Boston Medical and Surgical Journal

October 1, CLXXI, No. 14, pp. 509-544

59 Demand and Supply as Related to Nurses and Nursing. F. T. Murphy, St. Louis.
60 Roentgen Ray Evidence in Early and Latent Cancer of Stomach. F. W. White and R. D. Leonard, Boston.
61 Traumatic Endocarditis. S. G. Webber, Brookline.
62 *Intraspinous Use of Salvarsanized Serum. C. W. McClure, Iowa City, Ia.
63 *Report of Cases of Lung Abscess at Massachusetts General Hospital. C. L. Scudder, Boston.
64 Behavior of Neosalvarsan. W. J. McGurn, Boston.

62. **Intraspinous Use of Salvarsanized Serum.**—In four cases of cerebrospinal lues under treatment by McClure with intravenous injections of salvarsan, mercurial inunctions and the intraspinous use of salvarsanized serum, there has been observed improvement in the subjective and objective symptoms. With this improvement there has occurred a diminution in the cell count, the proteid content, and the strength of the Wassermann reaction in the cerebrospinal fluid. The Wassermann in the blood remained unaffected up to the time of leaving the hospital. Two cases of tabes were relieved of subjective symptoms and the number of cells in the cerebrospinal fluid reduced. A case of taboparesis showed no change in the laboratory findings and only slight improvement symptomatically. One case of paresis showed marked improvement in the symptoms and the laboratory findings. The Wassermann reaction became negative in the cerebrospinal fluid. One case of paresis showed no improvement in either the symptoms or the laboratory findings but grew progressively worse.

The results in cerebrospinal lues and tabes in the small series of cases studied in this hospital and those collected from the literature are encouraging not only as regards cessation of symptoms but also in the laboratory findings in the cerebrospinal fluids. The results in paresis are either discouraging or problematic. The most marked improvement has occurred in the laboratory findings and in these there has been a relapse in those cases followed for several months. McClure here admits that the improvement in mentality so far recorded may be but the result of remissions to which the disease is prone, even in the absence of treatment. But the fact that improvement may occur, even if only apparent, warrants the use of the intraspinous treatment in a disease otherwise hopeless.

63. **Cases of Lung Abscess.**—The details of sixteen cases of lung abscess treated by operation are reported by Scudder. He states that the bronchiectatic process should be attacked by the surgeon while it is limited to one lobe of a lung. There was one case of actinomycosis cured by surgical operation. Attention is attracted to lung abscess following tonsillectomy. There is one case in this series which followed operation on the nasal septum. Scudder suggests that the inhalation of foreign material may have been the starting point in this case. From certain cases in this series it is suggested that the surgeon should be alert to the occurrence of lung abscess associated with embolism following ordinary surgical operations. A patient suddenly suffering severe pain in the chest following surgical operation associated with a rise in temperature and pulmonary signs should be very carefully studied lest such signs may mean the beginning of pulmonary abscess. Early operative interference on the lung in such cases may not only preclude the possibility of the extension of a pulmonary lesion, but may save the life of the individual.

An increasing number of intra-abdominal infections are associated directly with an infection through the diaphragm of the diaphragmatic pleura, and then of the lung with pulmonary abscess. The cases of subdiaphragmatic origin must be attacked early to prevent subsequent damage intrathoracically. The Roentgen ray is of great value in the diagnosis of lung abscess. The thorough roentgenologic examination necessitates fluoroscopic observations, stereoscopic plates, and both anterior and posterior views. Scudder believes that this total series of sixteen cases demonstrates the efficacy of surgical measures in the treatment of abscess of the lung. There were nine deaths, eighteen recoveries and eleven cases were practically well without cough or sputum.

Journal of Parasitology, Urbana, Ill.

September, 1, No. 1, pp. 1-53

65 *Destruction of Vitality of Cysticercus Bovis by Freezing. B. H. Ransom, Washington, D. C.
66 *Two Years' Study of Insects in Relation to Pellagra. A. H. Jennings, Washington, D. C.
67 Variation in Oxyurias: Its Bearing on Value of Nematode Formula. S. B. Fracker, Chicago.
68 Eggs of Ascaris Lumbricoides. W. D. Foster, Washington, D. C.
69 Dr. Nott's Theory of Insect Causation of Disease. W. A. Riley, Ithaca, N. Y.
70 Rhabditin. N. A. Cobb, Washington, D. C.
71 Experimental Ingestion by Man of Cysticerci of Carnivore Tapeworms. M. C. Hall, Washington, D. C.
72 Peculiar Morphologic Development of an Egg of Genus Tropidocerca and Its Probable Significance. W. D. Foster, Washington, D. C.
73 Action of Arsenic Dips in Preventing Tick Infestation. H. W. Graybill, Washington, D. C.
74 Eorhynchus: Proposed New Name for Neorhynchus Hamann Pre-Occupied. H. J. Van Cleave, Urbana.

65. **Destruction of Cysticercus Bovis.**—From his experiments Ransom concludes that if measly beef carcasses are exposed for six days to a temperature not exceeding 15 F. (−9.44 C.) the vitality of the cysticerci will be destroyed, that some may survive in carcasses exposed for five days to this temperature, though it is doubtful whether they will retain sufficient vitality to develop in the human host, and finally that a considerable proportion may survive in carcasses exposed to a temperature of 15 F. for four days or less. Though it is possible that the vitality of the cysticerci, which were observed to be alive after exposure of the infested beef to a temperature of 15 F. for four days, has been so seriously affected that they would have been incapable of producing tapeworm infestation, the fact that they were alive and active justifies the adoption of a longer period of retention when refrigeration is employed as a sanitary measure. Likewise it would seem, notwithstanding the evidently weakened condition of the only cysticercus which survived in beef exposed five days to a temperature of 15 F., that it is not justifiable to accept five days as a safe period for refrigeration, and that six days should be required until it shall be shown that a shorter period of refrigeration is fully sufficient to prevent the possibility that cysticerci present in the refrigerated meat may retain enough vitality to continue their development in the human host. On the basis of the results which have been herein recorded, an amendment to the federal meat inspection regulations has been issued providing that beef carcasses showing a certain slight degree of infestation may be passed for food if held for six days at a temperature not exceeding 15 F., as an alternative to the requirement of retention for twenty-one days.

66. **Study of Insects.**—Jennings' studies have led him to believe that ticks, bedbugs, mosquitoes, fleas, horseflies, and, in the absence of further and more incriminating evidence, lice may be dismissed from consideration as transmitters of pellagra; that there is not only insufficient evidence to incriminate flies of the genus *Simulium*, but much evidence directly opposed to such incrimination, and that the biting stable-fly, *Stomoxys calcitrans*, shows in marked degree those characteristics of distribution, habit and association with man which would preeminently fit it to be the vector of pellagra if transmission of the disease by a blood-sucking insect is shown to be possible.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

September, VI, No. 1, pp. 1-146

75 *Control of Respiratory Exchange by Heating and Cooling Temperature Centers. H. G. Barbour and A. L. Prince, New Haven, Conn.

76 *Action of Drugs on Isolated Pulmonary Artery. D. I. Macht, Baltimore.

77 Influence of Temperature on Action of Strophanthin on Mammalian Heart. J. W. C. Gunn, London.

78 Condition of Sugar in Blood. C. L. v. Hess and H. McGuigan, Chicago.

79 *Pharmacologic Action of Opium Alkaloids. D. E. Jackson, St. Louis.

80 Combined Action of Camphor and Lack of Oxygen on Isolated Mammalian Heart. A. N. Richards, Philadelphia.

81 Convulsant Action of Acid Fuchsin in Cardiectomized Frogs after Removal of Anterior Lymph Hearts. D. R. Joseph, St. Louis.

82 Influence of Lymph Hearts on Action of Convulsant Drugs in Cardiectomized Frogs. J. J. Abel and B. B. Turner, Baltimore.

83 Vascular Response of Kidney in Acute Uranium Nephritis. W. deB. MacNider, Chapel Hill, N. C.

75. **Control of Respiratory Exchange.**—Barbour and Prince found that heating the region of the corpus striatum in rabbits results in a diminution in CO_2 output, O_2 combustion and in the respiratory volume, as well as in decreased body temperature. Cooling the same region gives precisely the opposite effects. These measures have no demonstrable effect on the respiratory rate except that the first mentioned may produce marked "heat polypnea." The decreased and increased oxidations thus produced by respectively heating and cooling the temperature centers are contributing causes rather than effects of the changes in body temperature. These results furnish proof that metabolic processes can be diminished by an agent (heat) whose activity is, under the conditions of the experiment, restricted to a limited region of the central nervous system. Heat centrally applied reduces body temperature therefore not only by favoring heat dissipation but by diminishing heat production.

76. **Action of Drugs on Pulmonary Artery.**—The action of a large number of drugs on strips and rings of surviving pulmonary arteries was studied by Macht. Epinephrin causes a powerful constriction of the pulmonary artery. After ergotoxin and a number of other drugs, the action of epinephrin on the isolated artery is inhibited. These observations speak strongly in favor of a vasomotor supply of the pulmonary artery. Of the digitalis bodies, all except digitonin produce constriction. The latter causes a dilatation of the pulmonary ring. The nitrites were found to produce a constriction of the pulmonary artery. It is suggested that this anomalous action of the nitrites is due to the pulmonary artery being richly supplied for the most part with vasoconstrictor nerve terminals. This action of the nitrites is corroborated by other experimental and clinical data, and points to a rational method of treating hemoptysis.

79. **Pharmacologic Action of Opium Alkaloids.**—While only a part of the opium alkaloids have been studied by Jackson, enough was demonstrated to indicate that probably a considerable majority of these derivatives are capable of producing marked bronchoconstriction.

Lancet-Clinic, Cincinnati

September 19, CXII, No. 12, pp. 305-332

84 Overweights. H. A. Baker, Pittsburgh.

85 Glands of Internal Secretions. B. Holmes, Chicago.

September 26, No. 13, pp. 333-360

86 Surgical Treatment of Infantile Palsy. J. K. Young, Philadelphia.

87 Work of Life Extension Institute Viewed Especially from Standpoint of Medical Examiner. A. T. Gaillard, Philadelphia.

88 Nature's Method in Cure of Tuberculosis. W. J. George, Johnstown, Pa.

Medical Record, New York

October 3, LXXXVI, No. 14, pp. 573-614

89 Surgical Management of Pericystitis. E. Fuller, New York.

90 Insanity Among Jews. A. A. Brill and M. J. Karpas, New York.

91 *Rational Diet for Typhoid. E. E. Cornwall, Brooklyn.

92 Oil-Ether Colonic Anesthesia. J. T. Gwathmey, New York.

93 Infection of Middle Ear with Bacillus Tuberculosis and Bacillus Coli. G. B. Lake, Jolo, Moro, P. I.

94 Abdominal Aneurysm as Cause of Left-Sided Abdominal Pain. E. H. Goodman, Philadelphia.

95 Country Physician and Congenital Club Foot. J. C. Schapps, Butte, Mont.

91. **Rational Diet for Typhoid.**—Cornwall has devised a plan of feeding in typhoid which is formulated in three dietetic prescriptions with modifications. Prescription 1, for the febrile period: At 6, 8, 10 a. m., 12 m., 2, 4, 6 and 8 p. m., give 8 ounces of a 2 to 1 mixture of milk and barley water, to which has been added 4 grains of sodium chlorid. At 9 a. m. and 5 p. m., give 7 ounces of orangeade made with the strained juice of 1 orange, 1 ounce of milk sugar and water. At any time during the day or night give water to drink but not more than enough to bring the total fluid ingested to 110 ounces, unless the weather is very warm and the patient desires it. If the patient has a weak heart the fluid should not exceed 90 ounces. This prescription supplies daily about 50 gm. of protein and fuel of the value of about 1,350 calories.

Prescription 2, for the transitional period: At 6 a. m. and 4 p. m., give 8 ounces of a 2 to 1 milk and barley water mixture, to which has been added ½ ounce of a predigested cereal food, 1 ounce of cream and 4 grains of sodium chlorid. At 7 and 11 a. m. and 5 p. m., give 7 ounces of orangeade. At 8 a. m., 12 m. and 6 p. m., give 7 ounces of well-boiled rice, cream of wheat, or similar cereal, with 5 ounces of milk and 4 grains of sodium chlorid. At 10 a. m., 2 and 8 p. m., give 8 ounces of artificially soured milk, or, if preferred the same as at 6 a. m. This prescription supplies daily about 70 gm. of protein and fuel of the value of about 2,100 calories. It can be given in the average case between the fifth and seventh day after defervescence.

Prescription 3, for the convalescent period: At 7:30 a. m., give 8 ounces of well-boiled cereal, with butter, milk or cream; 2 slices of dry toast, with butter; the juice of 1 orange, plain, or as in prescription 1. At 10 a. m., 4 and 10 p. m., give 8 ounces of artificially soured milk, or 8 ounces of the milk and barley water mixture described in prescription 2. At 12 m., give 8 ounces of a milk soup (cream of corn, celery, potato, carrot or spinach), or 8 ounces of artificially soured milk; 2 ounces of lean boiled, broiled or roasted beef, mutton, lamb or chicken; 6 ounces of boiled macaroni or rice, with butter, milk or grated cheese; 2 slices of toast with butter; fresh fruit juice, namely, of orange, grapefruit, grape or pineapple, to the amount of 4 ounces. At 6 p. m., give 16 ounces of milk in which has been crumbled 6 ounces of old bread or toast; or 4 slices of toast with butter, 2 ounces of cream cheese or pot cheese and 8 ounces of the milk and barley water mixture described in prescription 2. Orangeade, as in the preceding prescriptions, or similar fruit juice preparations, may be given freely at any time.

This prescription supplies daily about 90 gm. of protein and fuel of the value of about 2,500 calories. It serves as a standard convalescent diet which can be modified by additions and substitutions as convalescence progresses. It can usually be given on the twelfth day after defervescence. The fruits and vegetables should be added cautiously, especially those containing much cellulose. The plan of feeding in typhoid above described was employed by Cornwall in a series of 200 cases of that disease treated by him between June 15, 1910, and Aug. 12, 1914. This series is continuous. The number of deaths was eighteen; the mortality 9 per cent.

Mississippi Medical Monthly, Vicksburg

June, XIX, No. 2, pp. 23-44

96 Classification Diagnosis of Acute and Chronic Arthritis. J. B. Elliott, Jr., New Orleans.

97 Infantile Fermentative Diarrhea: Some Hygienic and Preventative Methods. H. M. Burnham, Moss Point.

New York Medical Journal

October 3, C, No. 14, pp. 649-696

98 Modern Warfare Against Tuberculosis as Disease of Masses. S. A. Knopf, New York.

99 Non-Operative (Tuberculin) Treatment of Tuberculous Glands of Neck. R. T. Morris, New York.

100 Effect on Blood-Pressure of Decapsulation of Kidney. E. H. Goodman, Philadelphia.

101 Postdiphtheritic Paralysis. W. M. Barton, Washington, D. C.

102 Los Angeles Bronchitis. J. A. Guthrie, Portsmouth, Va.

103 Acute Intestinal Obstruction. H. M. Armitage, Chester, Pa.

104 Expert Testimony from Standpoint of Lawyer. A. M. Holding, West Chester, Pa.

105 Quantitative Estimation of Albumin In Urine. M. Kahn and M. Silberman, New York.

106 Newer Teachings Concerning Disease of Gastro-Intestinal Tract. M. I. Knapp, New York.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

September, XIX, No. 3, pp. 77-119

107 Pyelitis in Children: Cause of Obscure Fever. F. H. Smith, Abingdon.
108 Plea for Early Clinical Diagnosis of Cancer of Rectum and Recto-Sigmoid Junction. B. C. Willis, Richmond.
109 Ureteral Calculus. L. T. Price, Richmond.
110 Rheumatic Fever—Cardiac and Renal Complications. O. C. Brunk, Richmond.

Texas State Journal of Medicine, Fort Worth

September, X, No. 5, pp. 179-214

111 Subconjunctival Injections. H. W. Woodruff, Joliet, Ill.
112 Double Cataract Operations Under Difficulties. E. H. Vaughn, Tyler.
113 Amblyopia Due to Tobacco and Alcohol. C. Joyes, Fort Worth.
114 Tobacco Habit: World-Wide Injury to Humanity. A. S. Garrett, Springtown.
115 *New Sign Differential Between Dilatation of Heart and Pericarditis with Effusion. W. J. Calvert, Dallas.
116 *Adrenals in Acute Infections. G. C. Kindley, Galveston.
117 Case of Banti's Disease, with Splenectomy, Death. R. L. Ramey, El Paso.

115. **New Sign Between Dilatation of Heart and Pericarditis with Effusion.**—The differential sign described by Calvert in THE JOURNAL, Aug. 22, 1910, p. 763, is as follows: In pericarditis with effusion the right lobe of the liver is low, varying in its position from the fifth interspace to the sixth rib; in dilatation of the heart the right lobe of the liver is high, varying in position from the fourth to the fifth rib. In each condition a narrow area of relative lung-liver dulness is present. Two cases of pericarditis with effusion are reported to confirm the clinical value of this sign.

116. **Adrenals in Acute Infections.**—Kindley believes that examination of the adrenals in patients dying of acute infectious diseases furnishes strong evidence in favor of the theory of adrenal insufficiency as an important factor in bringing about a reduction in blood-pressure and feebleness of heart action in many of these cases. He states that there is great need of further investigation on the part of clinicians, as to the value of epinephrin in raising blood-pressure and supporting the heart in acute infections, the indications for the use of the drug in these diseases and the best method of administration.

Vermont Medical Monthly, Burlington

September, XX, No. 9, pp. 221-242

118 Anoci-Association. G. W. Crile, Cleveland.
119 Intestinal Short Circuit for Intra-Abdominal Tubercles. Report of Case. G. S. Foster, Manchester.
120 Infantile Paralysis. C. K. Johnson, Burlington.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Roentgen Ray, London

August, XIX, No. 3, pp. 83-118

1 Curious Case of Spine and Hip Disease. C. Gouldesbrough, London.
2 Radioscopic Compressor Diaphragm Based on Bucky Effect. G. Holzknecht, Vienna.
3 Diathermy—Its Production and Use in Medicine and Surgery. E. P. Cumberbatch, London.

British Journal of Children's Diseases, London

September, XI, No. 129, pp. 385-432

4 *Cardiac Arrhythmia in Diphtheria. E. B. Gunson.
5 *Subacute Atrophy of Liver in Childhood. R. A. Chisolm.
6 Fatal Hemoptysis in Child Four Years Old. J. D. Rolleston and J. E. Robertson-Ross.

4. **Cardiac Arrhythmia in Diphtheria.**—Gunson's present paper is based on more than 750 polygraphic curves obtained from children under 10 years of age, in whom the diagnosis of diphtheria was confirmed bacteriologically: 120 cases were investigated. Polygraphic tracings were taken in all the severe cases, with a single exception, at least once a day from the time of admission. Twenty-five consecutive mild and moderately severe cases were traced on alternate days throughout their stay in hospital, a period varying from five to eight weeks, in order to determine the incidence and the nature of the arrhythmia in this type of case. Antitoxin.—Mild cases received on admission 8,000 units, cases of moderate severity 12,000 to 16,000 units, severe cases 16,000 to 20,000 units. In moderate and severe cases the antitoxin was repeated once or twice. Intramuscular injections were given in each case. The records were taken with a Mackenzie polygraph. By this means simultaneous tracings of the jugular and radial pulses were obtained with a time-marking record. The observations were made about the same time each afternoon.

Apart from normal sinus arrhythmia, the only type of irregularity met with in these cases was due to premature auricular contractions, which occurred in 28 per cent. of cases. They appeared as early as the ninth and as late as the sixty-sixth day of disease; their average duration was three days. They produced only slight arrhythmia and were ignored in treatment, as they were unaccompanied by any other symptoms or signs of cardiac involvement. Three cases, fatal from toxemia, developed no arrhythmia. Five cases developed so-called "cardiac paralysis," with gallop rhythm on auscultation, cardiac dilatation, hepatic enlargement and marked arrhythmia. This arrhythmia was due to the presence of frequent premature contractions, and in two cases these were followed by paroxysms of tachycardia. The nature of the arrhythmia is discussed in each case, together with the other physical signs present at the time.

5. **Subacute Atrophy of Liver in Childhood.**—Of the nine cases collected by Chisolm five were girls and four were boys, so that, unlike the acute form of the disease which is commoner in females than in males, there was no marked inequality of sex distribution, but of course the number of cases is very small. Jaundice was present in every case and was usually the first symptom to attract attention. In one case in which the jaundice was deep, the liver picture was that of acute necrosis attacking a liver previously affected with subacute necrosis. It would appear, therefore, that the depth of the jaundice is more or less proportional to the acuteness of the changes in the liver. The jaundice when once established usually tended to become progressively deeper. In two cases there was a history of previous attacks of jaundice.

Ascites was present in three cases. In two of these cases the changes in the liver were of the chronic type, approaching the cirrhotic, and the regenerative processes were widely diffused through the organ, while in the third case regeneration was limited to a small area in the left lobe, and the rest of the organ showed the microscopic picture of acute yellow atrophy. In none of the reports of these three cases is there mention of the condition of the portal vein or its branches.

The liver was somewhat enlarged at some period of the disease in all except one case in which it was normal to percussion, but slightly reduced in size at the necropsy, and another case in which it was not palpable during life and was reduced in bulk after death. In another case there is no note as to the size of the organ during life, but after death it was small. The enlargement was not always to be detected during life; it was usually regular, but in one case the left lobe was more affected than the right. Progressive diminution in size, which is such a marked feature in the acute type of the disease, and of considerable diagnostic importance, was noted in two cases and in both the diminution followed a previous increase in size. In one case the liver was enlarged to palpation on admission, but at the subsequent operation, eighteen days later, it was found to be normal or slightly reduced. The spleen was noticed to be slightly enlarged in one case, just palpable in another case and not palpable in a third case. In the other cases there is no note of its condition during life. Of the more general symptoms abdominal pain was of inconstant occurrence. Its absence is expressly recorded in one case while in three cases it was present with intermissions, and was never very severe in character. Vomiting was recorded in two cases in which it was severe. Light-colored motions were the rule, but neither diarrhea nor constipation was a marked feature of the series. Hemorrhages, which are so notable a symptom in the acute form of the disease, were only seen in two cases in which, while regenerative changes were present in the liver, acute necrosis

predominated. The temperature was noted as regularly and slightly subnormal in one case, high in two cases, normal in one case and irregular in one case in which, however, there was also present a general staphylococcal infection.

Drowsiness with death in coma was seen in two cases, while delirium was a terminal symptom in one case. Screaming and twitching followed by coma with localized paresis of the face and leg on the left side are recorded of one case but nervous symptoms were expressly noted as absent in another case and in none of the cases do they appear to have been very prominent. In all cases in which it is alluded to the urine contained bile; leucin and tyrosin, so often found in the acute type of the disease, were noted as absent in one case and in the other cases no mention is made of them.

British Medical Journal, London

September 19, II, No. 2803, pp. 493-524

7 Open-Air Hospitals in War-Time. R. Saundby.
8 Sterilization of Water Supplies for Troops on Active Service. G. S. Woodhead.
9 Examination of Recruits of Territorial Force and their Early Training. B. Hughes.
10 Insects and War: Lice. A. E. Shipley.
11 *Cardiac Fibrillation and Its Relation to Chloroform Anesthesia. J. A. MacWilliam.
12 *Blood-Pressure. G. S. Melvin and J. R. Murray.
13 Ventricular Fibrillation and Cause of Death Under Chloroform. A. G. Levy.
14 Rôle of Carbohydrate in Nutrition. E. P. Cathcart.
15 Recent Experiments Bearing on History of Sugar in Animal Body. J. J. R. MacLeod.
16 Influence of Excessive Water Ingestion on Excretion of Creatin and Creatinin. D. Burns and J. B. Orr.
17 *Action of Enzymes. E. S. Edie.
18 *Congenital Anomaly of Duodenum Encountered During Operation. S. Boyd.

11. **Cardiac Fibrillation and Its Relation to Chloroform Anesthesia.**—Although MacWilliam's observations were made on animals, he says, that the essential features of fibrillation and the general conditions favoring and determining its occurrence are so strikingly constant in all the warm-blooded animals examined that there is no warrant for assuming an exception in man, but, on the contrary, a strong presumption in favor of a broad similarity in the essential nature of its behavior in man and in mammals and birds. Further, there is the striking resemblance between the general features antecedent to or associated with early collapse in the cat and in many recorded instances in man tendency to excitement and struggling, with disturbance of respiration (holding the breath, exaggerated breathing, etc.). There is also a remarkable resemblance between the recorded phenomena of many cases of early collapse seen in man and those observable in the cat. MacWilliam believes that the conclusion is warranted that ventricular fibrillation is certainly the chief cause of the early chloroform collapse in the cat, and is probably a very important cause of early chloroform collapse in man.

12. **Blood-Pressure.**—In the application of the oscillation method Melvin and Murray have made use of two instruments: (a) the Erlanger sphygmomanometer, which yields a graphic record, and (b) the Pachon sphygmo-oscillometer, in which the oscillations are examined by visual inspection. As index of systolic pressure they adopted that known as the Recklinghausen-Erlanger index, namely, the pressure corresponding to the point at which, with falling external pressure, there is an appreciable increase in the magnitude of the oscillations. With regard to the estimation of diastolic pressure, they have departed from the index suggested and employed by Erlanger. Prolonged investigation with an experimental schema convinced them that diastolic pressure was to be read at a lower level and from the results brought forward in that experimental study they decided to adopt as the index of diastolic pressure the pressure corresponding with the point on the record at which, with diminishing external pressure, the oscillations showed an appreciable diminution in magnitude. The method of study consisted in the concurrent application of these two methods in a large number of cases, and in the correlation of the results obtained from each.

Roughly, two classes of individuals were examined: first, a set of healthy young adults of average age 20.9; and secondly, a series of old people and of patients manifesting pathologic conditions of circulation. In the "normal" series the authors examined 59 cases, and in all were able to make some determination of diastolic index from the tracing obtained by the Erlanger apparatus. In 19 cases, that is, 31 per cent., however, there was a discrepancy amounting to 10 or more millimeters between the oscillation and the auditory readings. Yet the average diastolic pressure of these 59 cases differed by the two methods by only 2.3 mm. Were the Erlanger index of diastolic pressure to be taken, that is, the reading corresponding with the last stage at which the oscillations are maximal, then the averages differed by 12.6 mm., with the oscillation reading higher than the auditory. In such cases as there occurred a marked difference between the oscillation and the auditory readings they accepted the latter, and for these reasons: At the systolic level similar differences frequently obtained, but at this point the pressure estimated by the tactile method confirmed the auditory reading. The actual pressures which they regard as the normal pressures may then be given as follows: Systolic pressure normally amounts to 111.8, diastolic to 65.7 and pulse pressure to 46 mm. This estimate of diastolic pressure is decidedly lower than the values commonly given, and the estimate of pulse pressure correspondingly higher. The average pulse rate was 80.1 per minute, but they failed to establish any definite relationship between the variations in the pulse rate and diastolic-pressure level.

In the second series of cases there is frequently great difficulty in making a reading of diastolic pressure from the tracing, frequent and serious discordance between readings thus made and the auditory reading. Here, as before, they accept the auditory indications. As the cases examined in this series yield a collection of pressure values in many varied conditions, there is little value in assessing averages. The authors compared the ranges of variation of the different pressures with the corresponding ranges in the "normal" series. Thus, in the latter, diastolic pressures from 82 to 50 were obtained, while in the "pathologic" series, value from 150 to 50 were got. Similarly, the range of variation of pulse pressure was, respectively, in the normal and the pathologic series, 73 to 22 and 163 to 26. There is thus a much greater range of variation in the pathologic series. The authors advance its simplicity, accuracy and applicability as reasons for the adoption of the auditory method as the most satisfactory method of blood-pressure estimation.

17. **Action of Enzymes.**—A consideration of the general similarity of the action of pepsin and trypsin or protein led Edie to the idea that both enzymes might unite with protein by combining with the same side-chains, but that the specific digestive side-chains differ by being active in acid and alkaline solution, respectively. If this were so, we might expect that pepsin, however, would be able to unite with protein in an alkaline solution, and trypsin would similarly unite with protein in acid solution, neither enzyme being in such cases able to exert any digestive action on the protein. In the former case the pepsin would act similarly to the zymoid of trypsin, excess of pepsin inhibiting the action of trypsin on protein. Excess of trypsin, on the other hand, might be expected to inhibit the digestion of protein by pepsin in acid solution. Experiments have shown that such is the case. If pepsin is mixed with excess of trypsin, its action on protein in acid solution is inhibited, the amount of inhibition being roughly proportional to the amount of trypsin present. For these experiments boiled fibrin was principally used as the substrate.

In a number of cases Edie found that boiled trypsin inhibits the action of fresh trypsin on fibrin, but not on caseinogen. This would seem to show that trypsin unites with fibrin by means of side-chains which are more thermostabile than those with which this enzyme unites with caseinogen. It was found also that excess of pepsin acting in an alkaline solution inhibits the action of trypsin on proteins, the inhibition again being proportional to the amount of pepsin present. Both enzymes acting in appropriate solution begin to digest fibrin

practically immediately, there being no preliminary interval during which any dissolved protein is first broken down into simpler products. While boiled solutions of pepsin varied considerably in their behavior, Edie found in some cases that practically all power to inhibit the action of trypsin was destroyed when the pepsin was boiled for half an hour, but different specimens of the enzyme show great variations in their power to resist destruction by heat. It is seen from these observations that the usual text-book statement that enzymes are destroyed in solution at a temperature of 70 to 80 C. must be modified. If trypsin solutions can be boiled in presence of acid without being destroyed, and in some cases without any appreciable loss of activity, there seems no inherent reason why other enzymes under suitable conditions should not resist considerably higher temperatures than they are generally supposed to withstand.

18. **Absence of Part of Duodenum.**—There was in Boyd's case a complete absence of the third and fourth parts of the duodenum and of the duodenojejunal flexure, and an abnormal position of the proximal part of the jejunum. The duodenum passed to the right and emerged as a coil of jejunum from under cover of the hepatic flexure, thence passing vertically downward through the right loin lateral to the ascending colon to the right iliac fossa, in which case it lay on the lateral side of the cecum. It then passed over the pelvic brim into the pelvis, beyond which point it was not traced.

Lancet, London

September 19, II, No. 4751, pp. 731-782

19 Dysentery. F. M. Sandwith.
20 Sterilization of Water Supplies for Troops on Active Service. G. S. Woodhead.
21 Juxta-Epiphyseal Strain of Lower End of Humerus and Its Detection by Diagnostic Line. E. W. H. Shenton.
22 *Cultivation of Tubercle Bacillus. A. H. Miller.
23 Ankylostomiasis in Fiji. P. Harper.
24 Earlier Indications of Gas Formation by Coliform Organisms. I. W. Hall and F. Nicholls.
25 Paratyphoid Inoculations. W. Broughton-Alcock.
26 Open-Air Hospitals in War Time. R. Saundby.

22. **Cultivation of Tubercle Bacillus.**—While working on the cultivation of the tubercle bacillus with the aid of waxy substances Miller found that the tubercle bacillus on glycerin-egg (Dorset's medium), to which has been added a little sperm oil, a liquid wax, loses its power in part to stain with carbolfuchsin. When stained with carbolfuchsin and simply washed, without being further decolorized, a peculiar appearance is presented. In shape it becomes plumper, much longer, and its ends terminate somewhat finely; this is best seen when stained by Gram's method. The protoplasm refuses to stain with carbolfuchsin in certain parts. In many of the bacilli the staining to non-staining parts assumes some regularity, first a staining portion either in the form of a band, or "granule," then a non-staining band or zone, and so on through the length of the bacillus, so that the bacillus looks extremely "beaded." These "granules" are large, round, refractile bodies, distending the body of the bacillus; they are extremely acid-alcohol-fast, and usually are the last to go on decolorizing with acid-alcohol. The bacillus can be, within quite a short time of decolorization, some few seconds, rendered colorless except for these refractile "granules." There does not appear to be any method in which the bands or "granules" are situated in the length of the bacillus.

Grèce Médicale, Athens

August 15, XVI, Nos. 15-16, pp. 29-32

27 Congenital Myotonia; Author's Third Case. (Cas de maladie de Thomsen.) B. Conos. Concluded in No. 17.

Beiträge zur Geburtshilfe und Gynaekologie, Leipsic

XIX, No. 3, pp. 315-478. Last indexed May 16, p. 1587

28 *Tubercles in Carcinoma of Uterine Cervix. (Tuberkelknötchen in einem Portiokarzinom.) E. Schmidt.
29 *Febrile Abortion and Its Treatment. F. Walther.
30 The Three Segments of the Uterus. (Zur Frage des Isthmus uteri.) H. Sternberg.
31 *Injury of Eye during Delivery, Especially Forceps Delivery. (Augenverletzungen bei der Geburt und bes. bei der Zangenoperation, und ihre gerichtlich-med. Bedeutung.) J. Goldwasser.
32 Serodiagnosis of Cancer by Abderhalden's Method. S. Blackstein.
33 Influence of Menstruation on the Blood-Picture in the Healthy. G. Gumprich.
34 The Antitrypsin Findings and Leukocytosis at Laparotomies. D. Gorbakowsky.

28. **Giant Cells in a Cancer.**—The *Beiträge* had just concluded its nineteenth volume when death took its founder and editor, A. Hegar. This article by Schmidt reports the discovery of tubercles scattered over the expanse of a cancerous growth in the uterine cervix. Necropsy revealed also multiple tuberculous foci in one kidney although the woman of 55 had been apparently healthy until the cancer developed. There were traces of horny substance near the giant cells in the cancer, and Schmidt thinks that the "tubercles" were the response to irritation from these foreign particles of horny substance, and were not the work of tubercle bacilli. None was found outside of the tuberculous kidney.

29. **Febrile Abortion.**—Walther reviews the experiences with 834 cases of abortion in Fehling's service at Strassburg; 134 were examined bacteriologically. Hemolytic streptococci were found in 50 and non-hemolytic in 24; hemolytic staphylococci were found in 24; in only 12 were the bacteriologic findings negative. In 212 cases there was fever but in exactly 50 per cent. of these the fever subsided at once after evacuating the uterus, including 49 cases in which the evacuation was done with the curet. In the 23 febrile cases with hemolytic streptococci, cureting was done in 54.4 per cent. In 3 cases the course was normal notwithstanding the presence of the hemolytic streptococci. In 3 cases with the latter, disaster followed expectant treatment. In another case colon bacilli were associated with the hemolytic streptococci and one patient, already a prey to sepsis when first seen, died. He tabulates further 26 cases in which the germs evidently had passed beyond the confines of the uterus as the fever kept up after the uterus had been evacuated; 84.6 per cent. in this group died, showing the gravity of these secondary streptococcus affections. In 12 other cases the fever was traced to peritonitis or pneumonia or an abscess.

The practical conclusion of these and other data cited is that the uterus should be emptied at once and as cautiously as possible and that we should not be deterred from this or from curetting by the discovery of hemolytic streptococci. After thorough examination, if the uterine process is found to extend beyond the uterus, treatment should be addressed to the secondary process first. If the infection is still restricted to the uterus, this should be evacuated, and he advocates the curet rather than the fingers. It does not scrape out so much as the fingers, but asepsis is much easier to realize with an instrument than with the hand. Even rubber gloves do not insure positively against mishaps, and the cervix has to be opened much wider for the fingers than for the curet. Still another advantage of the latter, he says, is that detritus of muscle tissue is much easier to remove with the curet than with the fingers; the finger does not even feel it, as a rule. The only exception is when large scraps of membrane and clotted blood cling fast to the uterus wall—here the finger does better than the curet. The latter glides over them, taking them to be part of the uterus wall. He adds that an expert is no more liable to perforate the uterus with a curet than with the finger. When hemolytic streptococci are found he advises evacuating the uterus with the fingers rather than with the curet although his experience has been so favorable with the curet that its use is justified in many cases. If the cervix is closed and rigid, and laminaria do not answer the purpose, he dilates with the metal dilator (Bossi). The fever drops and the patient usually promptly recovers. A vaginal douche with a little hydrogen dioxid or other disinfectant then washes out the last scraps of the fetal membranes. If the bleeding keeps up, he tampons with gauze dipped in 10 per cent. camphorated oil. The whole procedure is concluded with a dose of ergot.

31. **Obstetric Injury of Eye During Birth.**—Goldwasser declares that the physician should not be held to blame if the eye gets injured during the birth process as this may occur from deformity somewhere in the pelvis even with spontaneous delivery. If the injury should be done with

forceps, this may be unavoidable; it has happened to more than one skillful and long experienced obstetrician. He has compiled 132 cases of injury of an eye during birth and in only 3 of the cases had version and extraction been done. In 43 cases the presentation was not mentioned; in 86 the head came first. In 80 of the total 132 cases the injury was done with forceps, but in 25 cases delivery had been spontaneous but difficult on account of deformed pelvis. In 2 of the spontaneous cases the injury was exceptionally severe. Even when one is convinced that the forceps or awkward management of the delivery are responsible for the injury, yet it is hard to prove it. Goldwasser asserts there is actually no means certainly to avoid trauma of the eye during forceps delivery. It is wiser to refrain from applying the forceps to the fronto-occipital diameter. If it has to be done, the forceps should be guided by the left hand.

Berliner klinische Wochenschrift

September 7, LI, No. 36, pp. 1605-1620

35 *Differential Atmospheric Pressure Procedures. (Die jetzige Gestaltung des Druckdifferenzverfahrens.) L. Dreyer.
35 *Some Hitherto Unappreciated Actions of the Roentgen Rays. (Einige unbekannte Wirkungen der Röntgenstrahlen und ihre therapeutische Verwertung.) H. Eckstein.
37 Roentgenography of Liver and Spleen. (Klinische Anwendung der Röntgenphotographie der Leber und Milz.) E. Rautenberg.
38 Lupus of Syphilitic Origin. O. Heinemann.
139 Simple and Convenient Receptacle to Receive and Send Stool for Examination. (Faecotenor.) W. Kiel.

35. **Differential Atmospheric Pressure as Aid to Operations.**—Dreyer relates the history of the application of overpressure and underpressure in operations on the chest, saying that the positive-pressure procedure seems to have won most favor although all recognize that conditions with negative pressure are more physiologic. The use of oxygen instead of pure air has materially facilitated the method, as with oxygen the positive pressure need be only very little above normal. Intratracheal insufflation is a close competitor of the overpressure procedure, but he has found it difficult to get the right-sized catheter; too large, it hinders the outflow of air, and too small, it does not permit adequate inflow. He has also found difficulty in introducing the catheters without doing harm.

36. **Immediate Relief from Pain under Roentgen Rays.**—Eckstein declares that too little attention has been paid as yet to the analgesic action of the Roentgen rays. He discovered it accidentally in his own person when he sprained his hip-joint and suffered from constant pain. Finally he had it examined with the Roentgen rays to see if there was not some fracture in the joint, and to his surprise he had no more pain in the joint for a week and then it was mild and subsided permanently under a second exposure. The power of the rays to arrest pain immediately has been utilized in treatment of tumors, leukemia and pelvic disease, and it will probably prove equally effectual in neuralgia, gout, deforming arthritis, furunculosis, malarial spleen and tuberculosis. The dermatologists have long proclaimed its value in arresting pruritus with eczema, lichen ruber and fungoid mycosis. Eckstein relates several striking instances from his own practice; one patient after severe contusion of the spine came on crutches into the Roentgen room and left at once after the exposure, free from all pain, carrying the crutches in one hand.

Another promising field is to ward off after-pain in operative cases. The patient is wheeled into the Roentgen room and an exposure made as soon as the operation is finished, before he rouses, and not until then is he taken back to bed. Exposure of the chest and neck arrested reflex spasm preventing introduction of the larynx mirror in one case. Eckstein says that the above by no means exhausts all the indications for the analgesic action of the Roentgen rays. He has never witnessed any harm from the procedure. With inflammatory processes the results sustain his assertions of twenty years ago that checking the transmission of pain impulses seems to have an inhibiting effect on inflammation. He found that wounds dusted with an anesthetic powder healed much more rapidly than the controls.

Deutsche medizinische Wochenschrift, Berlin

September 3, XL, No. 36, pp. 1705-1724

40 *Dietetic Treatment of Hyperacidity, Hypersecretion and Peptic Ulcer. H. Strauss.
41 *Progress in General Anesthesia by Inhalation. D. Kulenkampff.
42 *Indicanemia and Uremia or Azotemia. J. Tschertkoff.
43 Albumin Content of Tuberculous Sputum. (Eiweissgehalt im Sputum Tuberkulöser.) G. Hafemann.
44 "Peanut Milk" in Infant Feeding. (Erdnussmilch statt Mandelmilch.) R. W. Raudnitz.
45 *The Wounded in the Present War. (Aus Verwundetenlazaretten.) V. Czerny.
46 Advantages of Ethyl Chlorid for Minor Operations. (Kleine feldärztliche Mitteilungen; Chloräthylrausch.) L. Fränkel.

40. **Dietetic Treatment of Hyperacidity, Hypersecretion and Peptic Ulcer.**—Strauss expatiates on the significance of the frequent coincidence of these conditions and preliminary stages of ulceration in the stomach or duodenum. The irritation from the erosion or ulcer keeps up excessive secretion and the excessive secretion keeps irritating the ulcer. Treatment should aim to break up this vicious circle, and treatment for one should always include treatment of the other. Experience is showing that only the superficial ulcers are amenable to internal treatment. Ulceration that burrows deep into the tissues is more rebellious, as also ulceration in or near the pylorus as this entails disturbance both in motor and secretory functioning. To spare the stomach and yet give sufficient nourishment while at the same time combating hypersecretion and hyperacidity is best accomplished, he is convinced, by feeding fat. He gives it in the form of butter, cream, egg yolk and cream cheese but not bacon fat.

In a specimen case of gastric ulcer, nothing was allowed by the mouth for three days; nourishment to a total of 600 calories was given by the rectum alone each day. The main reliance in feeding was on cream, egg yolk, butter, soft custards, white cheese, and vegetables and chicken or pigeon meat. The vegetables and meat are forced through a sieve and not given till the twenty-second day. The stomach gets thus nothing for three days; 231 gm. the fourth to sixth days; 823 gm. the seventh to ninth, representing 1,296 calories, and so on to 2,829 gm. by the end of the fourth week, with 3,976 calories a day. Nothing but fluid foods are permitted until the stools have been free from blood for eight or ten days. Then ten or twelve days are allowed for healing before the patient is permitted to get up. Each case must be individualized as to duration of the periods, and preparation of the food to tempt the appetite. By planning the diet in this way to combat hyperacidity and hypersecretion, we can scarcely ever do harm, while the neglect of this has often wrought serious damage, he is convinced.

41. **Recent Progress in Inhalation Anesthesia.**—Kulenkampff remarks that the published statistics of the mortality from general anesthesia are generally compiled from the larger institutions and present a more favorable picture than is true of smaller institutions. He cites a recent American compilation from private or small public hospitals which places the mortality of ether anesthesia at 1 to 500. He says that a general anesthesia is an experimental intoxication, and that when mixtures are used the ingredients vaporize under different conditions so that the exact amount of either actually inhaled cannot be ascertained. With deep and regular breathing, inhalation anesthesia is very different from what happens when the respiration is shallow and irregular. The slightest change in the tint of the lips or aspect of the face is a warning that should be looked for every two or three minutes at least.

He protests most decidedly against Henderson's views, reiterating that everything should be avoided which in any way tends to increase the poisonous carbon dioxid in the body or cause its retention in amounts above normal. Free air, not oxygen, is the main thing. Kulenkampff emphasizes the necessity for the anesthetics being given so that they steal insidiously over the patient, saying that not the narcosis but the impatience of the operator is the danger. When very slight anesthesia is desired, he keeps talking to the patient and insisting on his answering and he gives more or less ether as the answers are rational or show confusion. When this simplest and entirely harmless "conversa-

tion *Rausch*" is not practical, he uses ethyl chlorid. The outward relaxation of the patient is less important than inward tranquillity. The main progress in recent years, however, he thinks, is in the use of apparatus; with them the maximal concentration is not left to the arbitrary judgment of the anesthetist.

42. **Indicanemia and Uremia.**—Tschertkoff has been estimating the proportion of urea and indican in the blood-serum in 120 cases, including 51 of Bright's disease. He tabulates the findings in 13 cases of nephritis without azotemia; in 14 of acute nephritis with azotemia; in 13 of chronic nephritis with azotemia and in 24 controls. He never found—independently of the food—retention of urea in the serum nor any indican when the kidneys were functionally capable in sick or well. Indican is found constantly in the serum whenever there is retention of urea in kidney diseases. Indicanemia unfailingly accompanies a urea content of 1.5 per thousand, and this with chronic nephritis is a sign of severe and irreparable changes in the kidneys. This does not have the same grave prognosis in acute nephritis as with the chronic form. Even after the azotemia has been corrected by appropriate measures, the indicanuria may persist as the only sign of insufficiency of the kidneys.

Medizinische Klinik, Berlin

September 6, X, No. 36, pp. 1441-1460

47 Care of the Wounded in War. (Organisation des Feldsanitätsdienstes.) A. Köhler.
48 Epidemics during War Time. (Seuchengefahr im Biwak und in der Ortsunterkunft.) K. Brandenburg.
49 Care of the Wounded in Naval Battles. (Sanitätsdienst auf Kriegsschiffen beim Seegefecht.) Haenlein.
50 *The Accessory Cavities of the Nose in Connection with the Pathology of the Eye. (Bedeutung der Nasennebenhöhlenaffektionen in der Pathologie des Auges.) A. Elschnig.
51 Syphilitic Axillary Paralysis and Aneurysm; Two Cases. K. Tuczek.
52 Examination of the Urine for Sugar. (Welches sind für den praktischen Arzt die brauchbarsten Methoden zur Zuckeruntersuchung des Urins?) B. Glaserfeld.

50. **Importance of Sinusitis in the Pathology of the Eye.**—Elschnig expatiates on the great importance of the part played by the nasal accessory sinuses in the pathology of the eye. This is a discovery of the last decade, he says, and even now its importance is not appreciated until one witnesses the prompt cure of a recurring iridocyclitis, for example, when a suppurating process in an accessory sinus is discovered and cleared out. Neuritis of the optic nerve may develop from propagation of the suppurative process to the brain indirectly through the meninges or directly. In other cases the trouble is from compression of the orbit, eyeball or optic nerve from the enlarged sinus.

The most serious and the most common eye trouble secondary to sinusitis is inflammation of the optic nerve. He has encountered 16 unilateral cases of this kind; in 3 the ophthalmoscopic findings were normal, the neuritis being altogether retrobulbar; in 9 there were slight evidences of inflammation in the papilla and in 4 severe intra-ocular neuritis with choked disk. In 6 of the 14 cases measured, there was slight exophthalmos. In 7 cases the pupil was dilated but the reactions were not impaired. In 10 cases vision had been almost entirely lost on that side; in 3 there was merely central relative scotoma and in 3 absolute scotoma. Only in the severest cases was there restriction of the field of vision, especially for colors.

In all but 4 cases vision returned nearly or entirely to normal after treatment of the suppurative process in the accessory nasal sinus. In these 4 the eye trouble was of from four to fourteen days' standing; in 2 there was advanced intra-ocular neuritis; in 1 slight neuritis, and the findings were normal in the other case.

The sinus trouble ranged from mere catarrh to the severest hypertrophy, polyp growths or suppuration in the different cases, but only in 5 cases was the sinusitis suspected by the patient or physician, and only in one of these had its connection with the eye affection been suggested. The blind spot was not enlarged in any instance. When both eyes were affected the pupils were widely but irregularly dilated and the reactions were not always quite normal.

The diagnosis is peculiarly difficult when there is some nervous affection in addition to the sinusitis. Retrobulbar neuritis with central scotoma is by no means uncommon in multiple sclerosis. Sinusitis was found also in 3 cases of brain tumor and 1 of multiple sclerosis but the eye trouble persisted unmodified after the cure of the sinusitis under treatment. Syphilis was demonstrated in 5 of the total 35 cases of nasal sinusitis in ophthalmologic cases; orthostatic albuminuria, extreme indicanuria or cardiac defect was evident in one case each. In 5 cases the amblyopia had been attributed to tobacco poisoning until the sinusitis was discovered.

During the seven-year period in question, Elschnig has encountered 208 cases of disease of the optic nerve; the 35 cases with sinusitis thus form 15 per cent. of the total material. A cancer in the nose led to an abscess in the optic nerve in a case (soon to be published by Gradle of Chicago).

The prompt subsidence of the neuritis when the sinusitis is treated in time shows that with irritation of the optic nerve there is generally a curable stage if the toxic and mechanical influences can be removed. Sometimes vision improved immediately as the contents of the sinus were aspirated out.

Münchener medizinische Wochenschrift, Berlin

August 25, LI, No. 34, pp. 1833-1864

53 *Diagnosis of Form of Pulmonary Tuberculosis. E. Romberg.
54 The Granular Form of the Tuberculosis Virus. S. Weiner.
55 Mechanism of Development of Presbyopia and of Cataract. (Entstehung der Weitsichtigkeit und des Stars.) F. Schanz.
56 *Insomnia and Restless Sleep. (Schlafstörungen.) C. Happich.
57 *Salvarsan May Prove Dangerous with Latent Insufficiency on the Part of the Kidneys. (Zur Pathogenese eines Salvarsantodesfalles.) W. Wechselmann.
58 Hygiene in War. (Kriegshygiene.) A. Dieudonné.
59 The French Infantry Bullet. W. Straub.
60 *Acute Nephritis from Chilling. (Fall von akuter Erkältungsnephritis.) Gehrmann.
61 Dressings for Gunshot Fractures. (Wundverband bei Schussfrakturen.) Schönwerth.

September 1, No. 35, pp. 1865-1896

62 *Roentgenograms of the Bladder. (Ueber Zystographie.) O. Zuckerkandl.
63 Action on Blood of Roentgenized Serum. (Experimentelle Untersuchungen über die Wirkung von röntgenisiertem Serum (X-Serum) auf das Blut.) J. Glasbermann.
64 *Industrial Poisoning in Manufacture of Fertilizer. (Ueber neuartige gewerbliche Erkrankungen in Kalkstickstoffbetrieben.) F. Koelsch.
65 *Fatal Poisoning from Chineonal. (Vergiftungstod durch "Chineonal.") V. Erdt.
66 Electric Treatment of Obesity. (Ueber therapeutische Erfolge mit dem Degrassator nach Dr. Schnée.) A. Schnée.
67 The Phenolsulphonephthalein Test of Kidney Functioning. (Unsere Erfahrungen mit der Phenolsulfophthalein-Methode als Prüfungsmittel der Nierenfunktion.) O. Hess. Commenced in No. 34.
68 Surgical Notes from the Front. (Chirurgische Beobachtungen vom Kriegsschauplatz.) P. Kraske.
69 Distribution of Pseudo-Dysentery Bacilli. (Verbreitung der Y-Dysenteriebazillen.) O. Mayer.
70 Vaccine Therapy of Gonorrhea. (Zur Gonorrhöebehandlung mit Gonokokkenvakzin Menzer.) F. Becker.
71 Care of the Wounded in Naval Battles. (Seekriegschirurgie und kriegschirurgische Dogmen.) M. zur Verth. Commenced in No. 34.

53. **Diagnosis of Form of Pulmonary Tuberculosis.**—During the last twenty years Romberg has paid special heed to the nature of the anatomic process at necropsy, comparing it with the physical findings recorded during life, and has found remarkable agreement between them, especially when shriveling processes are accompanied by progressive changes. The number of bacilli in the sputum does not seem to be a reliable criterion for the prognosis but the Roentgen findings often differentiate between proliferating and exudation processes and show up a cavity more reliably than percussion auscultation. In his service at Tübingen in about one-seventh of all the cases of a tuberculous process in the left lung alone it had started in the hilus. The area of resonance in the third and second interspaces, near the sternum, grows less and slight changes in the respiration murmur are evident; a pathognomonic cavity develops here by preference. The process spreads from this point. Similar changes develop only rarely on the right side. Sometimes the first physical changes are between the shoulder-blades toward the right or at the right margin of the heart or, rather later, in the

right axilla. It is more difficult to obtain characteristic findings on the right side, and they are not evident so early. Roentgenoscopy alone will clear up the diagnosis in these puzzling cases.

Secondary catarrh and inflammation play an important part in the clinical picture. If physicians realized the frequency of these secondary complications and promptly favorable course as a rule—modifying materially the clinical picture—they would not jump at erroneous conclusions so often and ascribe the improvement observed to the medicine the patient happens to have been taking at the time. The literature on tuberculosis and on remedies for tuberculosis is eloquent testimony to the wide-spread ignorance in the profession of the prevalence of these complicating affections.

56. **Sleeplessness.**—Happich cites data to reaffirm anew the importance of directing our measures to the vascular system in treatment of disturbances in sleep. During slumber the tonicity of the vessels of the brain is reduced and the height of the pillows may be a factor in inviting or driving away sleep. Some persons do not sleep soundly because their pillow is too low, while the anemic require a high pillow or the relaxed vessels will not send blood enough into the brain. All measures which actively dilate the peripheral vessels tend to interfere with sleep; besides a hot bath and exhilarating doses of alcoholic drinks, he mentions a certain amount of physical exercise as tending to drive off sleep. He also lays great stress on the breaking up of habits of going to sleep under certain conditions. When sickness in the family, travel or worry has broken up the regular automatism of going to sleep, it has to be learned over again, and here sleep-producing drugs render valuable service, starting the automatic mechanism to work anew. But he does not approve of knocking the patient down, as it were, with a dose of the narcotic at bedtime. He gives a small dose of a sedative after the noon meal, again between 5 and 6, and again at 9. Thus taken, the sedative merely wards off the natural excitement of the close of day; the culmination of the various happenings of the day causes in all of us, he remarks, a kind of excitement or fever in comparison to the morning. By excluding this, sleep comes naturally. The importance of regulating the circulatory system as the main point in treatment of sleeplessness is illustrated by the case of a young wife under the emotion of the sudden death of her husband, who was given morphin and other narcotics but they only increased her excitement until it became almost delirium. Happich then had hydrotherapy applied, packing her entire body, and she quieted at once as the circulation became modified. The narcotics were then able to exert their effect and in half an hour she was asleep.

57. **Discussion of Fatalities after Salvarsan.**—Wechselmann reiterates that a certain proportion of these fatalities are due to the inability of the kidneys to eliminate the poison. The trouble is, in fact, a retention toxicosis with uremic symptoms. For this reason he never gives an intravenous injection of salvarsan to a pregnant woman without first testing the functional capacity of her kidneys with Schlayer's milk sugar technic at least. This reveals that many pregnant women whose kidneys are apparently functioning normally, in reality are suffering from kidney derangement to such a degree that superposing any extra task would bring on an inevitable break-down. The renal vessels often showed impairment while the tubuli were evidently still normally capable. In one case of pregnancy eclampsia, the tests revealed the typical findings of vascular hyposthenuria. In others they showed that the oliguria at the end of pregnancy does not necessarily imply anything wrong in the kidneys. The pregnant organism is already under such strain that it seems wiser to go below the dosage of salvarsan usual under other conditions, and to commence with small tentative doses, starting with 0.15 gm., subcutaneously, up to 0.45. In the fatal case reported by Frühwald recently, the patient was a girl of 18, six months pregnant. He made an intravenous injection of 0.75 gm. neosalvarsan in 2 c.c. fluid and repeated the dose five days later. The next day the girl developed hemorrhagic encephalitis and died in the evening. The kidneys may have suffered from previous infections, mercury or alcohol, so that they are unequal to the task of eliminating salvarsan in the usual dosage. This insufficiency should be detected in time and the dosage planned to conform to it.

60. **Acute Nephritis Following Chilling.**—Gehrmann relates that a man of 28 was revived after having been nearly drowned. He had been under water for five to seven minutes and died the next day of cardiac insufficiency. Necropsy revealed entirely acute hemorrhagic nephritis in a pronounced form. The rapid development of the nephritis after the chilling and the discovery of it so soon at necropsy, makes the case almost a clinical experiment.

62. **Cystography.**—Zuckerkandl gives a number of Roentgen pictures taken with technic similar to that for pyelography, showing different pathologic conditions in the bladder, and compares them with the histories in four cases of infiltrating cancer of the bladder, twelve of a pedunculated tumor in the bladder with no infiltration at the base, and a few cases of hypertrophied prostate. Very instructive findings can thus be obtained by filling the bladder with a weak collargol solution and taking the roentgenogram, then emptying the bladder and taking another, the conditions otherwise the same. Enough of the shadow-casting fluid will cling to a tumor or stone in the bladder to cast a shadow in the second roentgenogram. With a pedunculated tumor, filling the bladder with air after evacuation of the fluid may lift up the tumor. When cystoscopy was impracticable for any reason or gave dubious findings, this cystography proved extremely instructive. The fluid ran up into the ureters sometimes but this never was misleading.

64. **Industrial Poisoning in Manufacture of Fertiliser.**—The artificial fertilizer made out of lime subjected to intense heat contains about 57 per cent. cyanamid, and to this Koelsch ascribes the peculiar intoxication presented by the workers when they take alcohol. At other times the workers feel in usual health, but at the first or second swallow of the beer, wine or whiskey, the face and neck and shoulders turn deep red as if they had been burned, the discoloration on the trunk and arms resembling a scarlatinal eruption. The conjunctiva and mucosa in the mouth and throat are also extremely red. The extremities are cold; the respiration and heart-beat are accelerated. The attack lasts an hour or two, and if the man vomits or the bowels move, improvement follows at once. The more dust in the air of the workroom, the severer the attack if liquor is taken afterward. Since the workmen noticed the connection between liquor and the attacks they mostly refrain from alcohol in any form and the attacks do not return. The company supplies gallons of coffee free to the men and the place is better ventilated now.

65. **Fatality from Chineonal.**—Some chineonal tablets fell into the hands of a child of nearly 3 and it swallowed nine tablets during the day. At 7 the child seemed very sleepy and fell off its seat and vomited. The physician found arms and legs as if paralyzed, reflexes abolished, and stupor and cyanosis followed. The child died at 10 without having responded to lavage of the stomach and stimulants and artificial respiration. Necropsy failed to reveal any chemicals except that from 200 gm. of brain substance a few crystals were obtained which were evidently veronal, chineonal being a combination of veronal and quinin. The child had taken in the tablets 0.648 gm. veronal in six or eight hours. The lack of hyperemia in the brain showed that the fatality could not be ascribed to the quinin, although this probably aided in weakening the resisting powers. The antidotes for veronal poisoning are cited as ether and caffein, and for quinin poisoning, coffee, tea, injection of ether and atropin. Erdt suggests that possibly atropin might be tried for chineonal poisoning. In the case reported the father insisted that the physician was alone to blame for the child's death, declaring that he had suffocated it during the rinsing out of the stomach.

Zentralblatt für Chirurgie, Leipsic

September 5, XLI, No. 36, pp. 1433-1464

72 *Resection of Lobe of Lung with Hermetic Closure of Stump of Bronchus. (Exstirpation von Lungen und Lungenlappen mit Versorgung des Bronchialstumpfes durch frei transplantierte Fascia lata.) K. H. Giertz.

72. **Resection of Lung.**—Giertz says that it is a simple and comparatively harmless matter to remove the entire lung of a rabbit or other small animal, ligating the hilus stump. It is not necessary to ligate separately the stump of the bronchus. None of the rabbits in his experiments died. He found that rhythmic intermittent positive pressure kept up the respiration perfectly. The operation is more difficult the larger the animal, but he succeeded in eight of ten large dogs in a still more complicated operation, closing the stump of the bronchus air-tight, reenforcing the suture with a small flap of fascia lata, sutured to cap the bronchus stump and then buried in living tissue. The day after the operation even the larger dogs were up and at play. There was no primary infection in any case.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 30, XXXV, No. 104, pp. 1089-1104

73 *Operative Treatment of Aneurysms. R. Mosti.

September 6, No. 106, pp. 1121-1136

74 Refutation of the Arguments of the Antivaccinationists. (La vaccinazione antivaiolosa.) C. S. Materazzi.

73. **Operative Treatment of Aneurysms.**—Mosti reviews the long history of operative treatment of aneurysms and emphasizes the advantages of excising the sac, illustrating his remarks with a typical case. The patient was a man of 37 and the aneurysm in the lower third of the femoral artery had developed rapidly and attained a large size in two months causing intense pain and other disturbances. The aneurysm was opened, the clots were cleared out and then the sac was released from the numerous adhesions binding it down and was removed. A small piece of the wall had to be left adherent to the femoral vein. Except for a slight transient rise in temperature, recovery proceeded smoothly for nearly a week when the skin of two toes became gangrenous, but after removal of the gangrenous skin conditions returned to clinically normal and by the end of two months the man was completely cured.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

July 4, II, No. 1, pp. 1-104

75 *Treatment of Chronic Intestinal Catarrh in Children. J. C. Schippers.

76 Paraffin Prothesis for the Eyeball. (Insluiting van paraffinekogels in sklera-buiden en kapsel van Tenon.) R. Speleers.

77 Workmen's Compensation Legislation. J. A. Korteweg.

75. **Intestinal Catarrh in Children.**—Schippers reports nine cases of long chronic intestinal catarrh in children from 1½ to 5 years old in which he succeeded in curing them by restriction to concentrated albumin milk, 1 liter a day, for ten to twelve days. Albumin milk has proved effectual in infant feeding, and Schippers explains how the same factors at work in infancy may prove effectual in the disturbances in older children resulting from intolerance for carbohydrates. In certain cases the intolerance for carbohydrates leads to chronic catarrhal irritation in the bowel. The stools are spongy, with gas bubbles, have a sharp acid smell, give the reaction for acid with litmus paper, and Gram-positive bacteria are found on smears. It is in cases of this nature that surprising benefit follows when the diet is modified to contain large proportions of albumin with very little carbohydrates. L. F. Meyer has published a standard diet for such cases, containing albumin, cheese, meat, etc., but very little carbohydrate. Schippers uses a bean soup, which has a high albumin content, instead of the expensive commercial food recommended in Meyer's ration.

But better than all this, for reasons which he describes in detail, is a systematic ten to fourteen days' course of albumin-milk feeding. He gave the children one liter of undiluted, concentrated albumin milk, with nothing else but rice water sweetened with saccharin. In one, two or three days the child appeared normal, and for the first time in months, possibly, the stools were no longer fetid or mucous. This course of albumin milk was followed by a diet according to Meyer's outline. The albumin-milk treatment gives the intestine a chance to rest, the balance between the flora of the small and large intestine becomes restored and the child becomes able to tolerate carbohydrates better. The formula of the albumin milk he used calls for: 3.6 per cent. albumin; 1.5 to 1.6 per cent. milk sugar; 3 per cent. maltose; 2.8 per cent. fat and 0.62 per cent. mineral elements. It represents 572 calories.

Hospitalstidende, Copenhagen

September 2, LVII, No. 35, pp. 1081-1112

78 *Animal-Parasites Cancer. J. Fibiger. Commenced in No. 34.

September 9, No. 36, pp. 1113-1136

79 Treatment of Recent Subcutaneous Fracture of the Patella; Fifteen Cases. P. Zachariae.

78. **Animal-Parasite Cancers.**—In this second and last instalment of his report Fibiger gives the microscopic findings in several of the twelve rats which he fed on cockroaches infected with the *Spiroptera*, as described in these columns October 3, p. 1244. The results of this recent research confirm those of his former work in this line, demonstrating the development of malignant disease under these conditions. In one rat there was pluricentric development of the cancer; this rat was killed the sixty-fifth day. The malignant disease developed under the action of the *Spiroptera* even in some quite young rats. The cancer developed in three or four months in the rats and in one case there was metastasis in the lungs when the animal was killed the hundred and fourth day. His total material now includes nineteen cancers developing in the stomach after feeding the rats with roaches infected with *Spiroptera*. This he regards as meaning that under certain conditions one-half or four-fifths of the animals infected develop cancer, and that no individual predisposition is necessary for this.

Ugeskrift for Læger, Copenhagen

September 3, LXXVI, No. 36, pp. 1541-1578

80 *Roentgen Treatment of Superficial Cancer. (Om röntgenbehandling of hudkraft.) J. Nordentoft.

81 *Experiences with Roentgen and Radium Treatment of Cancer. S. Nordentoft.

80-81. **Roentgen Treatment of Cancer.**—J. Nordentoft tabulates the minute details of the twenty-one cases of external cancer in which the patients are apparently cured as the cancer has vanished and there has been no sign of recurrence during the interval since, which ranges from a few months to three years. The tumors were all on the face except one at the mouth of the urethra.

S. Nordentoft was the first physician in Denmark to report a case of deeper cancer with multiple metastases in which a clinical cure was realized with Roentgen exposures. The young woman had had one ovary removed fifteen months before for a supposed benign tumor; the cancer was in the remaining ovary which was then removed. Three weeks afterward the Roentgen treatment was commenced when already there were several metastasic lumps to be felt; one in the pouch of Douglas was a knobby tumor as large as a fist. The Roentgen treatment was applied systematically and the metastasic tumors subsided; others developed at other points again and again and each time they retrogressed under Roentgen exposures. Several times he had expected to present her at a meeting of his medical society but each time new metastases developed in the interval between the sending in of the notice and the meeting. At present no tumors can be palpated and there is nothing apparently abnormal in the pelvis except that the serosa is rough and irregular in the pouch of Douglas. He has not given up hopes of a final cure as the metastases develop now with longer intervals and seem to be more susceptible to the Roentgen rays. There is also a kind of auto-immunization to be counted on, like a vaccine therapy, from absorption of the cancerous tissue. He reports further a number of other cases of cancer given Roentgen treatment with encouraging results. He regards it as superior to operative measures even for superficial cancers, as it does not sacrifice any tissue, even the stroma of the cancer is saved, and he believes that there is less danger of recurrence. Last but not least, patients come for treatment at an earlier stage when they know they do not have to submit to a mutilating operation. His experience with radium, on the contrary, has been unfavorable. Treatment of cancer, he reiterates, requires individualization and skilful application of adjuvants as needed.